the OIL AND GAS JOURNAL

The Multi-range *lightweight* BJ Type "T" Tong

for Drilling or Production Rigs

A series "B," type "T" tong handling 2½" E.U.E. tubing.

Reverse view of same tong. This tong, with proper interchangeable jaws, will also handle 1¼" upset coupling, 1½" plain coupling, 2" tubing, 1½" upset coupling, and 2" plain coupling.

Designed to lighten and speed up the job of running tubing, BJ type "T" tongs are equally valuable in "nippling up" or as lay tongs. Made in five series, A, B, C, D, and E, with available jaws in each series to handle API tubing and coupling sizes from 1" to 4" plain or upset.

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BJ STANDS FOR ENGINEERED OIL TOOLS

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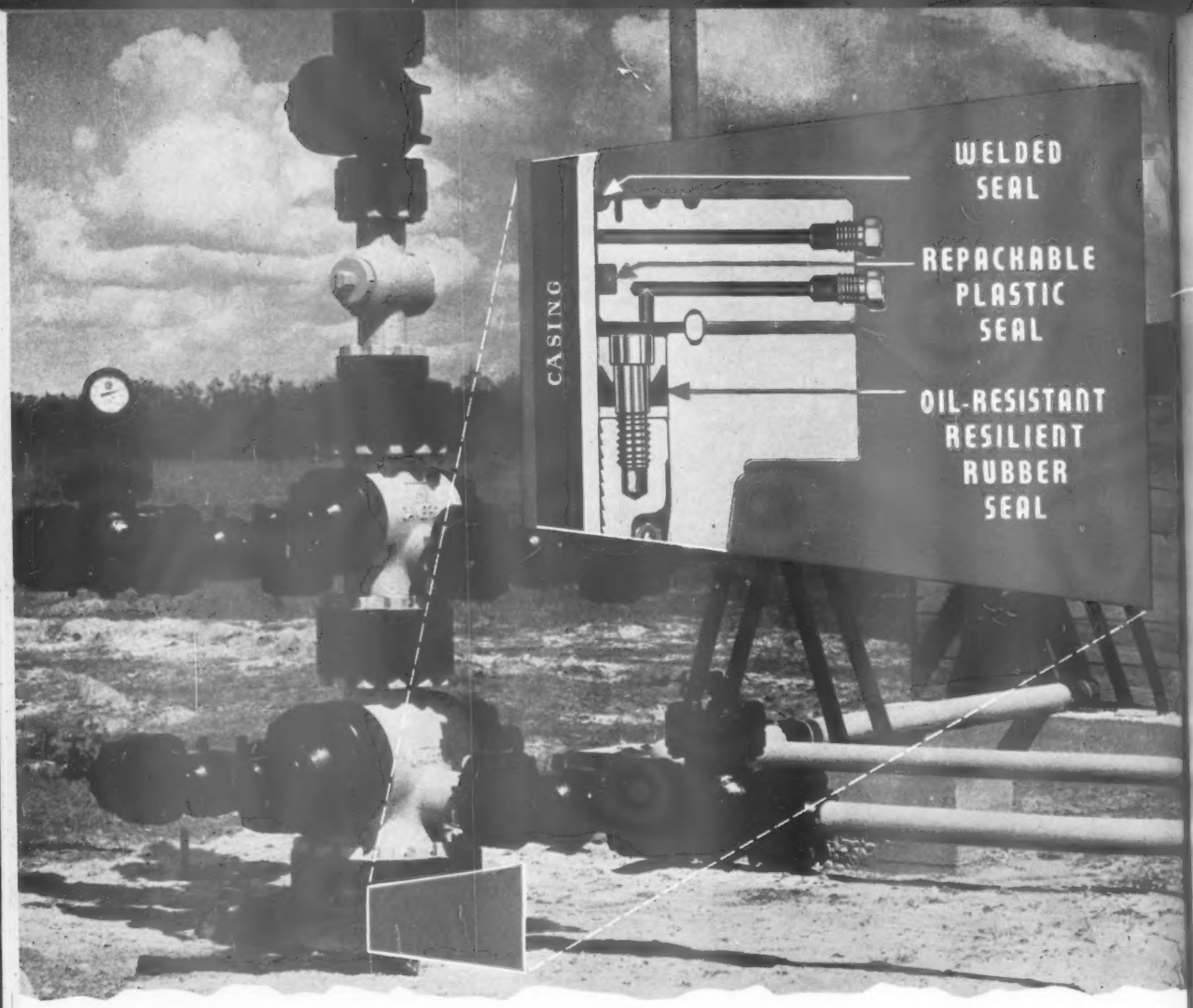

Here is the Cameron triple-seal casing head that more and more operators are using as a dependable safeguard against pressure equalization. Its three separate and distinct seals provide *defense in depth* against hazardous well pressures: (1) A primary resilient seal (oil-resistant rubber) is effected by tightening socket-head cap screws to apply sealing compression on the seal ring above the slips. (2) A secondary plastic packing seal is effected by injecting stick plastic thru a port in the testing flange, thus forcing a recessed molded asbestos seal ring into sealing engagement with the pipe. This seal can be tightened, should the need ever arise, by simply injecting more plastic material thru the ball-check valve equipped port. (3) Finally, a welded seal may also be applied between the testing flange and the pipe. Hydraulic test pressure may be applied thru drilled passages in the flange to test all three seals.

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As One Oil Man to Another . . .

HOW IS YOUR "I.D."?

(Every day more progressive operators are using the Baker Rotary Casing Scraper to make the inside or "working surface" of their casing clean, smooth and full diameter so that future work will be easy and safe to do.)

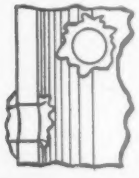
AN OPERATOR SAYS:
"We don't consider a well is complete until the casing is scraped smooth and clean."

ANOTHER USER SAYS:
"By running the scraper while the equipment is up and the crew is on hand, we leave the casing in smooth, clean condition for future work."

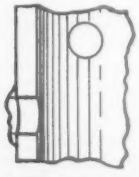
CASING SCRAPER

BAKER OIL TOOLS INC. — BAKER — SERVING THE WORLD

REMOVES BURRS LEFT AFTER GUN PERFORATING



BEFORE SCRAPING

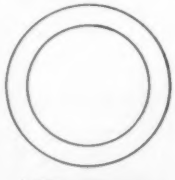


AFTER SCRAPING

RESULTS The sharp burrs left after gun perforating are entirely and easily removed by the Baker Rotary Casing Scraper. Operators figure that the Casing Scraper rental is more than paid for by savings on swab and packer rubbers, and by the elimination of time lost through re-running damaged packers.

CLEANS OUT ALL CEMENT & SCALE

BEFORE SCRAPING



AFTER SCRAPING

RESULTS When running the bit to drill out cement, just make up the Baker Rotary Casing Scraper in the string. The scraper blades clean casing to its FULL I. D.

FOR RENT In all Domestic Oil Fields

BAKER OIL TOOLS, INC.

the OIL AND GAS JOURNAL

Trends

Crude-Oil Production
By States—Page 152

CRUDE-OIL STOCKS 220,781,000 bbl. as of June 30—down 193,000 bbl. One year ago 228,860,000 bbl.

GASOLINE STOCKS 86,472,000 bbl. as of June 30—down 990,000 bbl. One year ago 81,984,000 bbl.

RESIDUAL FUEL-OIL STOCKS 40,488,000 bbl. as of June 30—up 595,000 bbl. One year ago 52,769,000 bbl.

GAS OIL AND DISTILLATE STOCKS 32,213,000 bbl. as of June 30—up 452,000 bbl. One year ago 35,242,000 bbl.

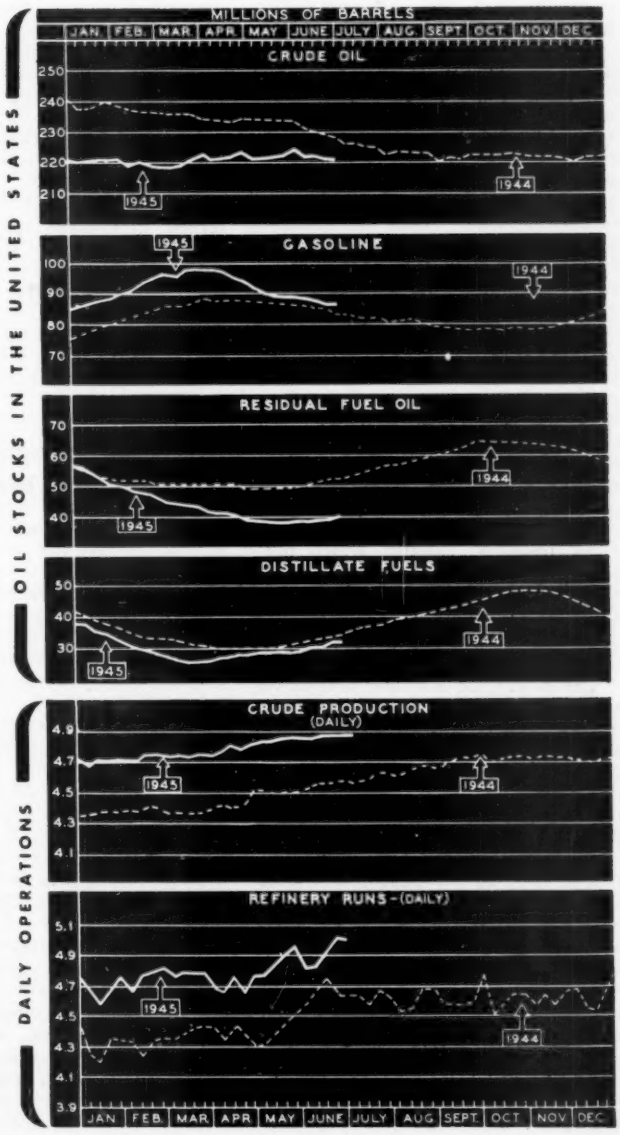
CRUDE-OIL PRODUCTION 4,890,500 bbl. as of July 7—down 8,150 bbl. One year ago 4,563,550 bbl.

REFINERY RUNS 4,999,000 bbl. daily week ended June 30—down 3,000 bbl. One year ago 4,634,000 bbl.

MILITARY strategy in certain phases of the Pacific war is obviously ahead of schedule. Recent decreases in the anticipated demand for diesel fuel oil from Middle West refineries for Navy consignment confirms the assumption. Naval requirements, originally fixed at 50,000 bbl. daily from Middle West (District 2) plants, have been dropped back to 20,000 bbl. Petroleum Administration for War officials explain that arrangements have been made to secure an equivalent amount of diesel fuel from other sources without mentioning where the supply will originate. Military authorities are reticent as always to disclose details.

PROGRESS of the Australians in the campaign to liberate Borneo appears to be one of the important reasons behind Navy petroleum-supply changes which are otherwise unexplained. Much of the western Borneo producing area has been cleared of Japs and this week the Balikpapan area with its even more important fields is being liberated. Military action alone, of course, is not the explanation of why requirements for diesel fuel oil from this country have been modified. The well-organized program of prompt rehabilitation of producing fields, processing facilities and transportation systems has made it possible to make almost immediate use of liberated oil properties.

THE campaign in Borneo is merely a preliminary step in liberating the entire group of Netherlands East Indian islands. Much more important petroleum resources await Allied troops in Sumatra. Equally well organized plans have been perfected to restore Sumatran oil operations as quickly as service forces can be moved up behind troops. From a military viewpoint, the petroleum supplies made available in the South Pacific islands are highly significant. Rough calculations show that 1 bbl. of oil in the Netherlands East Indies is the equivalent of 5 bbl. in the United States for consumption in the Pacific military theater. The relief from an exceedingly difficult production schedule on diesel fuel in the Middle West is particularly welcome. The central states constitute one of the largest home heating oil consuming sections of the country. Provision of minimum domestic requirements next winter would have been an almost impossible assignment if the higher quota of 50,000 bbl. of diesel fuel oil per day had prevailed until October.



Formula Developed for Sale of Surplus Tankers When War Ends

WASHINGTON.—A new ship disposal bill which would set a statutory sale price based upon 75 per cent of the prewar cost of war-built tankers, prohibit charter of U. S. owned tankers and make it possible to readjust earlier sales tc conform to the provisions of the new bill, was reported out last week by the House merchant marine committee.

Designed to set a fairly liberal policy for handling surplus vessels of all types, the bill, H. R. 3603, is substituted by the committee for two previous ship disposal bills. It is understood that the committee will seek early action in the House.

The bill, introduced by the committee chairman, Schuyler O. Bland of Virginia, applies to all war-built vessels, defined as ocean-going vessels of 2,000 gross tons or more, constructed or contracted since January 1, 1941, and constructed and acquired by the U. S. since September 3, 1939. Under the Surplus Property Act of 1944, the Maritime Commission is sole disposal agency for surplus vessels suitable for commercial use.

Basic pricing for tankers is 75 per cent of prewar domestic cost for the type involved, minus normal depreciation of 5 per cent and wartime depreciation in addition of 4 per cent. This formula will be adjusted downward to take care of alterations needed to put the vessel in class or to add desirable features incorporated in standard tankers of the class involved. Tankers which possess new features not standard to the average will be priced proportionately higher.

Price Floor Provided

The Bland bill also sets a floor on tanker prices at no less than 50 per cent of the average construction cost of tankers of the same type delivered during 1944. A 5 per cent differential in favor of unsubsidized operators is included in the pricing provisions.

Purchasers would be required to pay at least 25 per cent down, with the balance, for new vessels, payable over a maximum period of 20 years, at 3½ per cent interest and with the obligation secured by a preferred mortgage on the vessel. For tankers 3 years old, payment period would be reduced to 17 years.

Provision is made for sales both to citizens and foreign purchasers, with a priority to U. S. nationals. Foreign sales would be permissible under this bill, the committee pointed out, and the bill limits the types of vessels which may be sold to foreign purchasers. C-type vessels and tankers may be sold to foreign buyers only after a period of 6 months in which U. S. firms have had an opportunity to purchase.

Trade-In Arrangement

To encourage U. S. firms to replace old or obsolete tonnage with surplus vessels, the bill provides trade-in arrangements for citizens and for certain foreign corporations controlled by citizens. In determining trade-in value, the commission is ordered to take into consideration the scrap value in American and foreign markets, depreciated value based on a 20-year life and the market value for operation in world trade or in foreign or domestic trade of the United States.

War built vessels may be transferred to citizens in settlement of claims against the United States resulting from the requisitioning during the war and for indemnity for the loss of requisitioned vessels.

Tankers may not be chartered under this bill. The prohibition was explained on the basis of the special problem of corrosion of tankers carrying gasoline or kerosene. If chartering were permitted, the committee pointed out, operators would charter government owned tankers for the "clean" trade and use their own for the less corrosive "dirty" trade of diesel, fuel oil and crude.

Since a substantial number of vessels have already been sold by the commission and chartered back to the government, this bill provides that the agreed purchase price be adjusted to conform with the statutory price. As a condition to receiving an adjustment, purchasers must agree to treat the sales for all purposes as if they had been made under the bill. Provision is also made for determining liability of the U. S. for loss of a vessel on the basis of the readjusted price, depreciated to the date of loss.

Coastwise Regulation Modified

The bill also provides that Section 27 of the Merchant Marine Act of 1920 will not prohibit a war-built vessel from engaging in coastwise trade merely because it was under foreign registry on May 27, 1941, if it is otherwise entitled to engage in coastwise trade.

A national defense reserve is created under the bill, for which vessels may be designated by the Secretaries of War and Navy. In addition, vessels owned by the commission 2 years after the end of the war, if they are of sufficient value to make their maintenance worth while, will go into this reserve.

Northern Ordnance Sells Pennsylvania Property

Pennsylvania's biggest oil property sale in the last two decades is being made by Northern Ordnance, Inc., of Minneapolis, in the Grand Valley district. Six large leaseholds, approximately two-thirds of the acreage Northern Ordnance holds in Grand Valley, is being sold to a group of New York interests in association with individuals in Titusville, Pa. The group will be known as the Patoil Corp. and will be headed by C. C. Hogg, Pleasantville, veteran oil production engineer, as general manager.

The properties being purchased include National Petroleum Co., Averill, Fertig, Ley, Shoreman, and Schofield, all on Goodwill Hill. There are approximately 1,600 wells on the property, many recently drilled and never placed in production. Sale will be effective July 31.

The Patoil Corp. will continue the development work on the holdings with a view toward securing a maximum production. The corporation will office in Pleasantville.

Ship Deliveries for June Include 14 Tankers

WASHINGTON.—Of the 107 vessels delivered in June from U. S. Maritime Commission shipyards 13 were standard tankers and 1 a private tanker. Builders of these oil-carrying ships were: Alabama Dry Dock & Shipbuilding Co., Mobile, 3; Kaiser Co., Inc., Portland Ore., 4; Marinship Corp., Sausalito, Calif., 2; Bethlehem-Sparrows Point Shipyards, Inc., Sparrows Point, Md., 1; Sun Shipbuilding & Dry Dock Co., Chester, Pa., 4.

Increases Posted in Three Wyoming Oil Fields

Sinclair Wyoming Oil Co. has posted a 5-cent increase, effective June 1, in its price for crude oil in Lost Soldier (other than Ten Sleep sand oil), Crooks Gap, and Bailey Dome fields, all in Wyoming, making the price for oil below 21° 85 cents per bbl. with 2 cents added for each degree upward to 40° and over at $1.25.

Ickes to Negotiate Anglo-American Pact

WASHINGTON. — Secretary of the Interior Harold L. Ickes will go to London in the near future to renegotiate the Anglo-American oil treaty, President Truman announced last week.

This announcement set at rest for the time being recurrent rumors that Ickes is on his way out of the cabinet and would soon be replaced by a Truman appointee. Presumably it means that Ickes will remain Secretary of the Interior until his work with the oil treaty has been completed.

The Anglo-American oil agreement has been redrafted by the State Department to meet objections of the oil industry, and the new version must now be accepted by the British before it can again be submitted to the Senate. No date for the London trip has been set, but it probably will be soon after the British Government is reorganized after July 26. The current hope of the State Department is to work out a document in such form that other nations may join simply by signing and without the necessity for an international conference to write a multilateral oil agreement.

Wooden Barges No Longer Needed for Heavy Fuel

WASHINGTON.—Use of wooden barges in the water-rail movement of heavy fuel oil between Texas refineries and Norfolk, Va., has been discontinued, Office of Defense Transportation announces. These barges, resorted to in the war emergency, carried the fuel oil from Texas ports over the Gulf Intracoastal Canal to Panama City, Fla., and from that point tank cars were used. Tankers, now temporarily available for the Atlantic Coast trade, have made the barges unnecessary, ODT said.

Lawrence C. Turner, director of ODT's Waterways Transport Department, said that the use of wooden barges was purely a wartime emergency caused by the withdrawal of tankers from domestic service and the shortage of material to build steel barges. In spite of difficulties, Turner said, wooden barges gave a satisfactory performance in the limited service for which they were designed.

Standard of California Wins Fourth Safety Award

Standard Oil Co. of California last week became the first industrial concern in the United States to win four awards from the National Safety Council for "distinguished service to safety."

The record was achieved with the delivery of a safety award to officers and crews of the company's tanker fleet. This in itself was the first such award made to any western oil company. The certificate and "S" pennant were presented to J. L. Hanna, vice president in charge of marine operations, by Earl Campbell, western regional director of the council.

Better Tank-Car Situation Ends Need of Reports

WASHINGTON. — Daily telegraphic and mail reports from shippers of liquid commodities and operators of tank cars have been discontinued, Office of Defense Transportation announces. Additional tankers are now available for coastwise oil shipments, thus relieving the railway tank-car shortage.

Col. J. Monroe Johnson, ODT director, said a study is being made of the tank-car situation with a view to suspending other liquid commodity transportation regulations. "However," said Colonel Johnson, "many of the tankers now in coastwise service may be withdrawn late this fall for foreign service, thus causing a tightening in the tank car situation. In such an event it might be necessary to reinstate the filing of daily telegraphic and mail reports."

Rocky Mountain Shipments Of Oil to Midwest Cut

WASHINGTON. — Shipments of crude oil, asphalt, and residual fuel oils from the Rocky Mountain region to the Midwest have been prohibited by Petroleum Administration for War, owing to heavy demand for fuel oil on the Pacific Coast by the Navy and War Shipping Administration for the war against Japan. Deputy Petroleum Administrator Ralph K. Davies said the action was designed to increase the quantity of bunkering fuels available on the West Coast and to shorten shipping distances of such fuels.

The order forbids shipments of the specified oils from Montana, Wyoming, Colorado, Utah and Idaho (PAW's District 4) to Ohio, Kentucky, Tennessee, Indiana, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Oklahoma, Kansas, Nebraska, South Dakota and North Dakota (PAW's District 2).

Three exceptions are named. One permits shipments to continue to certain parts of Nebraska, South Dakota and North Dakota because of their accessibility to the Rocky Mountain producing areas. The other exceptions provide for shipments to other sections of the Midwest to prevent unreasonable hardship in individual cases and to avoid shortages.

Supplies of oils of the type covered in the directive have been short in the midwestern states, it was explained, but it is expected that future shortages in that area can be made up by shipments from the Southwest.

Army-Navy Oil Purchase Agency Established

WASHINGTON. — Joint Army-Navy Petroleum Purchase Agency has been established by the War and Navy departments for the buying of liquid fuels and lubricants. This new agency is made up of purchasing units representing the bureau of supplies and accounts, Navy Department; quartermaster general, Army Service Forces, and commanding general, Army Air Forces.

The purchasing units will be under the direction of Comdr. A. A. MacKrille, for the Navy bureau of supplies and accounts; Lt. Col. Royal Linden, for the fuels and lubricants division, and Col. Harry W. Howze, for the Army Air Forces. Contracts will continue to be placed under the direction of the respective commands.

Freight-Rate Surcharges Are Reduced by WSA

WASHINGTON. — War Shipping Administration has announced important reductions in tanker freight-rate surcharges applicable to movement of bulk liquid cargoes in various trade routes in the Western Hemisphere. A uniform surcharge of only 10 per cent is ordered on basic freight rates on bulk petroleum and its products moving to and between ports outside continental United States, eliminating many individual and widely varying surcharges heretofore effective. Surcharges similarly are reduced in the case of many other bulk liquid cargoes carried in tankers, such as molasses, creosote, benzol, etc.

Certain changes in basic freight rates are made for the South American trades, and a new scale of small-tanker rates has been fixed for operations to the Windward and Leeward Islands, British Guiana and the Netherlands Guiana.

Crude-Oil Imports Average 230,595 Bbl. Daily on East Coast

WASHINGTON. — Crude oil imports at East Coast refineries from Latin American producing countries averaged 230,595 bbl. daily during the 6 weeks ended June 23, it was disclosed here this week by the Petroleum Administration for War. Receipts on the eastern seaboard totaled 9,685,000 bbl. during the 6 weeks and constituted 28 per cent of all crude-oil delivered to eastern plants during the period.

During the same 6 weeks in 1944, East Coast receipts of Latin American crude oil averaged 127,760 bbl. daily and represented 18 per cent of the deliveries at that time, according to PAW.

The Bureau of Mines last week also made its first wartime report on imports and exports of petroleum disclosing that exports of refined products in 1943 reached the highest level in 4 years while exports of crude held fairly steady during 1941, 1942 and 1943. Bureau of Mines data, in the form of a preprint from the forthcoming Minerals Yearbook, show that imports of refined products in 1943 reached the highest total on record while receipts of crude in the 1941-43 period fell sharply.

No figures on exports and imports for later than 1943 have been made available.

Imports of refined products in 1943 totaled 49,066,000 bbl. against 23,669,000 bbl. in 1942, 46,536,000 bbl. in 1941, 41,089,000 bbl. in 1940 and 25,965,000 bbl. in 1939.

Imports of crude totaled 13,833,000 bbl. in 1943, 12,297,000 bbl. in 1942, 50,606,000 bbl. in 1941, 42,662,000 bbl. in 1940, and 33,095,000 bbl. in 1939.

Exports of refined products totaled 110,293,000 bbl. in 1943, 83,073,000 bbl. in 1942, 75,592,000 bbl. in 1941, 78,970,000 bbl. in 1940 and 116,883,000 bbl. in 1939.

Exports of crude totaled 38,341,000 bbl. in 1943, 33,834,000 bbl. in 1942, 33,238,000 bbl. in 1941, 51,499,000 bbl. in 1940 and 72,076,000 bbl. in 1939.

Exports of motor fuel in 1943, 51,381,000 bbl., comprised nearly half the total refined exports. These were the highest exports of motor fuel since 1930.

Virtually all the increase in gasoline exports is attributable to aviation-gasoline shipments, it is stated, belief being expressed that exports of 100-octane should continue to increase as military operations expand.

Exports of kerosene in 1943 were 4,619,000 bbl., highest in 3 years; imports were 375,000 bbl.

Exports of distillate fuel were 24,862,000 bbl., highest in 3 years; imports 15,992,000 bbl.

Exports of residual fuel in 1943 were 16,766,000 bbl., highest in 3 years, imports 26,567,000 bbl.

Lubricating oil exports in 1943 were 8,756,000 bbl., little changed from recent years.

Amendments to Public Land Law Intend to Facilitate Leasing

WASHINGTON. — A series of amendments to the public land laws to facilitate oil leasing and production on federal lands are incorporated in a bill (S. 1236) introduced jointly by Senators Joseph C. O'Mahoney of Wyoming and Carl Hatch of New Mexico.

The changes were evolved through a series of conferences with representatives of the oil industry and the Department of the Interior, and while they do not include all amendments sought by some sections of the industry O'Mahoney said they probably represent all the changes which the department is likely to accept. Hearings on the measure will be held by the committee on public lands both in Washington and in the western states this fall.

The acreage limitation for one lessee in one state is raised from 7,680 to 15,360 acres, and the present limitation of 2,560 acres in one field is removed.

Advance rental is terminated on discovery, and a minimum royalty of $1 per acre per year is provided.

The bill eliminates the requirement that the Secretary of the Interior must approve all assignments to qualified lessees.

Where a discovery has not been made at the end of a 5-year lease but drilling operations are in progress the bill provides that the lease be extended for 2 years. A similar extension is provided for a lease withdrawn from a unit cooperative plan or for the assigned portion of a lease on which production has been discovered.

The Secretary of the Interior is given discretionary instead of mandatory power to pass on cooperative or unit-development plans.

The bill also provides that the Government shall take its royalty in kind in cases where the secretary is not satisfied with the posted field price.

Senate May Take Early Vote on Resolution 50

WASHINGTON. — House Concurrent Resolution 50, expressing intent of Congress to permit deduction of intangible drilling costs for income-tax purposes by the petroleum industry, may receive consideration in the Senate next week. The resolution already has received House approval and merely awaits Senate concurrence to become binding.

The resolution was introduced in the House by Chairman Doughton of the Ways and Means Committee, received unanimous committee approval and received a substantial majority in the House vote. It was called on the Senate calendar July 2 but a single objection by Senator Murdock of Utah delayed consideration. Senator George, chairman of the Finance Committee, in charge of the resolution in the Senate, has returned to Washington and sponsors of the measure are seeking early consideration.

Revised Spacing for Some Kansas Fields

CHICAGO.—Revised spacing regulations for two fields and spacing patterns for two other fields in Kansas were announced by the Petroleum Administration for War. The Kraft-Prusa and Forest Hill fields, in Barton and Russell counties respectively, were allowed 20-acre spacing. In Kraft-Prusa the wells must be located in the northeast and southwest quarters of a quarter-quarter section; in Forest Hill, the locations are northwest and southeast quarters of a quarter-quarter section.

Patterns for the 40-acre spacing in the Hammer and Clearwater fields in Barton and Sedgwick counties respectively, were announced. In Hammer, the well may be located in either the northeast or southwest quarter of a quarter-quarter section. In Clearwater, the well may be located in either the northwest or southeast quarter of the quarter-quarter section.

THIS WEEK

U. S. Navy Photo from Acme

Tank farms on Guam, with capacity to refuel the entire Pacific fleet, typify the chore outlined for the domestic and Allied petroleum industry until Japan surrenders. Nearly 4 days of steady pumping through the big-inch pipe line would be required to fill the Guam tank farms, one of which is shown above

STRIDES— First commercial production of allyl chloride and second of allyl alcohol begun at Shell's Houston refinery. . . . Allyl chloride has big role in pain-easing drugs. . . . ¶Huntington Beach, eager for fog-free city, may employ British invention for removing ocean mists with oil-burning device. . . . ¶One of WPB's reconversion plans is stimulation of technological advancement by pilot plants, laboratories, experimental shops. . . .

TIRES—No more tires of all natural rubber, WPB says. . . . Use of synthetic to range from 100 per cent for small tires to 5 per cent for giant casings. . . . ¶More butyl synthetic rubber now available for inner tubes of large tires. . . . Holds air better than natural. . . . ¶U. S. planning to produce 1,200,000 tons of synthetic rubber in 1946. . . . More than quantity of natural rubber consumed in world in any prewar year. . . . Goal for this year, 1,000,000 tons. . . .

PRODUCTION—National daily crude output reverses trend and drops 8,150 bbl. . . . Total 4,890,500. . . . Major decline in Kansas, 30,950. . . . Texas up 28,950. . . . ¶Bill in Congress, designed to stimulate search for oil on public domain, changes leasing limitation from 7,680 acres to 15,630. . . . Operators invited to discuss measure at hearings in western states. . . . ¶Extensive drilling projected in Chaco region, Paraguay. . . .

INTERNATIONAL—Ickes preparing to submit to Britain "clarified revision" of oil pact. . . . Commission it sets up would operate on theory there is plenty of oil in world. . . . Should be handled on nondiscriminatory basis. . . . ¶More than 28 per cent of crude oil reaching East Coast comes from Latin America. . . . Was 18 per cent in 1944. . . . Provided 9 865,000 bbl. in half-year ended June 23. . . . Increase ascribed to availability of tankers and increased Venezuelan production. . . . ¶Europe took 70 per cent of country's refined-oil exports in 1943. . . . ¶Plans for construction of refinery at Brownsville, Tex., by Mexican Petroleum Administration presented to Mexico's president. . . . Would supply oil products for Monterrey, Saltillo, Torreon. . . .

BOOM—Venezuela getting ready for another oil boom, second in 25 years. . . . Will center around eastern and central part of the country. . . . Late comers now paying Government $180 an acre and 33 1/3 per cent royalty for concessions near proven fields. . . . ¶Discovery of 800-ft. section of Woodbine sand in southern Houston County, Texas, sets off lively geophysical campaign. . . . Nine major companies have 11 seismograph and 1 gravitimeter crews working. . . . ¶Carbon-black sales in 1944 hit record peak, 937,430,000 lb., 49 per cent higher than 1943. . . . Exceeded production by 135,570,000 lb . . . Stocks lowest since 1928. . . . ¶Cities Service pays $1,202 an acre bonus for 110-acre lease on restricted land of Indian tribes, McClain County, Oklahoma. . . . Believed highest on record. . . .

TRANSPORTATION—Tankships loading oil products for Pacific war theaters at "undreamed of" rates at Los Angeles' 14 terminals. . . . Rule books thrown away. . . . New techniques developed . . . More oil burned in Pacific than in both European and Pacific theaters before V Day. . . . ¶Use of wooden barges in water-rail transportation of heavy fuel between Texas refineries and Norfolk, Va., discontinued. . . . Tankers now available, at least temporarily. . . . ¶Additional tankers enable ODT to suspend daily telegraphic and mail reports from liquid-commodity shippers and tank-car operators. . . .

Earnings Reflect Record Operations

by F. J. Sansone*

OIL-COMPANY financial statements covering operations for 1944 reflect the successive new peaks to which the industry has pushed its operations in order to meet the steadily increasing wartime demand for petroleum products. With relatively few exceptions, annual reports of leading oil companies reveal substantial increases in sales, earnings, and assets.

The aggregate net income of a group of 32 leading oil companies, comprising over two-thirds of the domestic oil industry, amounted to $715,053,778 for the year ended December 31, 1944. This was an increase of $146,514,045 or 26 per cent over the total of $568,539,733 reported by these companies in 1943.

Reflecting the increases of 11 per cent and 16 per cent respectively in crude-oil production and refinery runs last year, the volume of business handled by the group was the largest in history. Gross operating revenues of the 32 companies increased $1,508,573,590 or 22 per cent to total $8,328,933,209 as compared with $6,820,359,619 in 1943.

The proportionally greater increase in dollar sales as compared with volume reflected increased production of higher-priced light petroleum products as well as the many abnormal sales and purchases of crude oil and products among the different companies due to the continued disruption of normal transportation routes and sudden changes in military requirements.

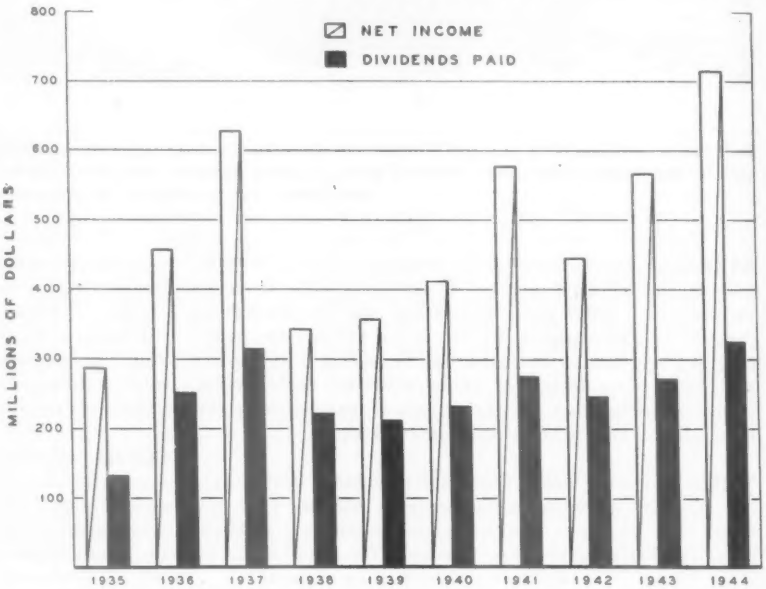
While net earnings of the industry last year established a new high, surpassing for the first time the pre-war peak made in 1937, a number of the reports indicated that, to the extent that higher earnings reflected increased production of crude oil, profits were not normal. This is because a large part of the increased earnings represented the liquidation of crude reserves acquired at low cost during past years, which, judging from the steadily rising cost of finding oil in recent years, can only be replaced at much higher costs.

Greater volumes of crude-oil production and refinery throughput and the absence of normal competitive factors because of the ready market for all petroleum products permitted reductions in unit operating costs with the result that most oil companies were able to report increased earnings despite rising costs, heavy taxes, and ceiling prices. However, as so often in the past, the effect of the various factors influencing earnings was not uniform on all companies and individual company results varied over a wide range depending upon the nature and location of their principal activities and the extent to which they were subject to excess-profits taxes.

Of the 32 companies covered in this report, all but 7 showed increased earnings last year with gains ranging up to 73 per cent. In general, the large integrated companies heavily interested in refining activities and those producing companies

*Carl H. Pforzheimer & Co.

NET INCOME AND DIVIDENDS
32 OIL COMPANIES



COMPOSITE INCOME ACCOUNT AND BALANCE SHEET OF 32 LEADING OIL COMPANIES

Income Account—	1944	1943
Gross Operating Income	$ 8,328,933,209	$ 6,820,359,619
Depreciation, Depletion, Etc.	827,082,065	650,549,499
Provision for Income Taxes	384,600,401	376,111,841
Net Income	715,053,778	568,539,733
Cash Dividends Paid	322,420,022	271,543,572
Assets—		
Current Assets	$ 3,740,719,016	$ 3,458,806,247
*Property, Plant and Equipment	6,015,764,998	5,790,788,407
Investments and Advances	939,477,276	959,835,329
Miscellaneous Other Assets	177,498,046	187,989,680
Total Assets	$10,873,459,336	$10,397,419,663
Liabilities—		
Current Liabilities	$ 1,361,497,254	$ 1,276,359,877
Funded and Long-Term Debt	1,191,210,013	1,247,090,031
Common Stock	3,742,803,000	3,730,272,318
Preferred Stock	212,870,582	208,444,437
Capital Surplus	869,651,903	873,092,772
Earned Surplus	2,564,840,768	2,196,995,759
Other Liabilities and Reserves	930,585,816	865,164,469
Total Liabilities	$10,873,459,336	$10,397,419,663

*Net after reserves for depreciation, depletion, etc., amounting to $6,585,627,211 in 1944 and $6,103,273,972 in 1943.

EARNINGS AND DIVIDENDS OF 32 OIL COMPANIES—1935-1944

Years—	Net income	Cash dividends
1944	$715,053,778	$322,420,022
1943	568,539,733	271,543,572
1942	444,812,059	244,053,844
1941	578,822,387	276,007,571
1940	412,157,371	231,415,557
1939	356,154,046	210,193,197
1938	341,083,662	220,897,663
1937	629,144,287	311,935,027
1936	458,820,512	251,625,745
1935	287,719,407	132,979,607

which were able to increase production materially made the most favorable comparisons. In this class were: Atlantic Refining Co.; Gulf Oil Corp.; Humble Oil & Refining Co.; Phillips Petroleum Co.; Skelly Oil Co.; Socony-Vacuum Oil Co., Inc.; Standard Oil Co. of New Jersey; Standard Oil Co. of Ohio, and Texas Pacific Coal & Oil Co.

The group reporting lower earnings was comprised mainly of companies substantially interested in producing activities whose increased development charges more than offset the benefits of higher production and sales. Companies so affected were: Barnsdall Oil Co., Continental Oil Co., Plymouth Oil Co., Seaboard Oil Co., and South Penn Oil Co.

More than half of the 32 companies paid higher dividends in 1944 than in 1943. Combined cash dividends of the group amounted to $322,420,022 or 45 per cent of aggregate reported net earnings. This was an increase of 19 per cent over 1943, when disbursements totaling $271,543,572 were equal to 48 per cent of reported earnings.

The balance of net income carried to surplus and reserves after the payment of dividends in 1944, amounted to $392,633,756 which, together with $827,082,065 charged against income for depreciation, depletion, amortization, etc., provided all of the funds required for additional working capital and capital expenditures. Aggregate charges for capital extinguishments last year represented an increase of 17 per cent, reflecting greater provisions for depreciation and depletion due to the increased production rate and the more active exploratory and development program undertaken by the industry. Provisions for accelerated amortization of war-plant facilities also contributed to the increase in property writeoffs.

The accompanying summarized composite balance sheet of the 32 companies for 1943 and 1944 shows that the petroleum industry continued to finance its wartime expansion in the same manner as it had its phenomenal growth between the two world wars—mainly through the reinvestment of undistributed earnings. Total assets increased $476,039,673 during the year to a total of $10,873,459,336 as of December 31, 1944, while long-term debt declined $55,880,018. Capital stock, represented by common and preferred shares, increased $16,957,827.

War-Plant Outlays Heavy

It has been estimated that in addition to the huge sums spent in expanding their normal activities, oil companies in the United States expended about a billion dollars of their own funds for war-plant facilities during the 4-year period 1941-1944. The industry provided the capital required for this expansion entirely from its own operations, as borrowed capital during this period increased only 30 million dollars.

How this was done is apparent from the record of earnings and dividends. It will be seen that the group of 32 companies reported aggregate net income of $2,307,000,000 for the years 1941-1944, inclusive. Of this total $1,114,000,000, or less than one-half, was distributed as dividends and the balance of $1,193,000,000 retained in the business. Over the past 10 years assets of the group increased 3.1 billion dollars of which only about 500 million dollars was derived from new capital.

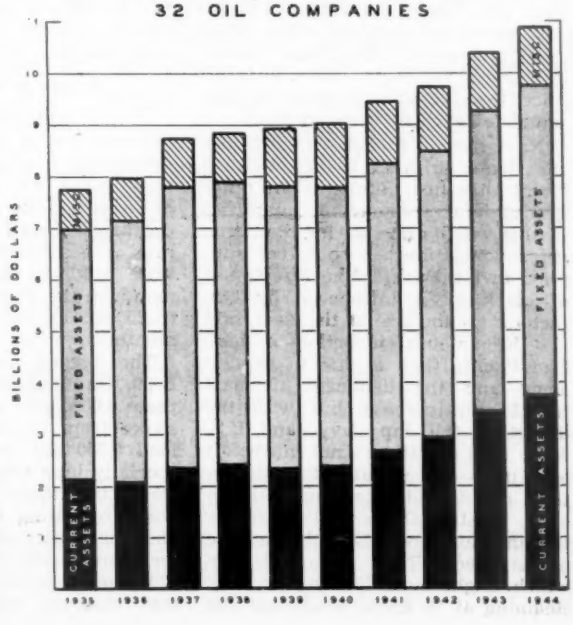
The substantial increase in the volume of business last year necessitated the carrying of larger receivables and this, together with the larger cash balances required to meet heavy tax liabilities, is reflected in the higher totals of current assets and current liabilities at the 1944 year-end. Current assets, however, showed a materially greater increase and net working capital increased $196,775,392 to a total of $2,379,221,762. The ratio of current assets to current liabilities was 2.8 and net current assets were equal to twice total long-term debt.

While most of the construction projects undertaken by the industry to handle its greatly expanded wartime operations have been completed, capital demands of the industry in the years ahead are expected to continue heavy even if demand for petroleum in the immediate postwar period should temporarily decline as anticipated. The heavy withdrawals of oil from underground reserves will have to be replenished by intensified exploratory and development programs and large expenditures will have to be made in connection with the restoration of marketing facilities to their pre-war status. Furthermore, the impetus given by the war to the new refining processes will undoubtedly result in substantial additional refinery construction. It is for these reasons that oil companies have been anxious to conserve their cash resources through the continued pursuance of conservative financial policies.

NET INCOME FOR 1944 AND 1943 FOR 32 COMPANIES

	Net Income	
	1944	1943
Amerada Petroleum Corp.	$ 5,285,988	$ 4,781,770
Atlantic Refining Co.	14,710,913	10,686,445
Barnsdall Oil Co.	3,674,766	3,602,764
Continental Oil Co.	12,020,526	14,080,702
Empire Gas & Fuel Co.	11,008,863	10,334,871
Gulf Oil Corp.	42,075,513	29,301,053
Houston Oil Co.	2,340,908	2,092,347
Humble Oil & Refining Co.	60,525,774	45,711,511
Lion Oil Refining Co.	1,464,669	1,377,826
Mid-Continent Petroleum Corp.	6,942,038	6,566,618
Ohio Oil Co.	15,082,126	14,146,802
Pacific Western Oil Co.	1,185,442	1,071,040
Phillips Petroleum Co.	20,952,088	14,168,422
Plymouth Oil Co.	2,161,667	2,237,597
Pure Oil Co.	16,392,178	13,874,517
Richfield Oil Corp.	3,935,396	3,995,057
Seaboard Oil Co.	1,881,284	1,949,096
Shell Union Oil Corp.	28,163,961	24,542,556
Sinclair Oil Corp.	27,367,794	23,083,709
Skelly Oil Co.	7,222,903	5,461,708
Socony-Vacuum Oil Co., Inc.	62,349,556	35,944,983
South Penn Oil Co.	3,622,638	3,806,074
Standard Oil Co. of California	43,467,996	36,116,060
Standard Oil Co. (Indiana)	59,225,577	50,591,371
Standard Oil Co. of Kentucky	3,009,398	3,056,366
Standard Oil Co. (New Jersey)	155,396,460	121,327,773
Standard Oil Co. of Ohio	6,744,014	4,905,633
Sun Oil Co.	13,350,217	13,353,524
Texas Co.	54,516,819	42,889,797
Texas Pacific Coal & Oil Co.	2,256,110	1,309,900
Tide Water Associated Oil Co.	17,787,202	14,902,640
Union Oil Co. of California	8,932,994	7,269,199
Total	$715,053,778	$568,539,733

DISTRIBUTION OF TOTAL ASSETS
32 OIL COMPANIES



Distance Prevents Oil-Operation Curb Until Japan Falls

by Henry Bd. Rolph

PEARL HARBOR. — Reasons why end of fighting in Europe means no letup for the U.S. oil industry in supplying petroleum war products are readily apparent in a visit to the forward areas in the Pacific and talks with the Navy's oil supply officers.

Activity throughout the Pacific, even in the rear bases, is increasing daily and everywhere there are signs that the stage is set for much heavier blows than any Japan has felt yet. Future requirements already plotted by oil logistics men show sharply ascending curves for all products, and these estimates were made prior to deployment of U.S. forces from Europe to the Pacific.

Total military requirements for oil can't be forecast now because they depend on the final strategic plans for defeating Japan and the length of time the Japs hold out, but some of the factors involved should be helpful to the oil industry in understanding the demands which will be made of it.

The four main petroleum products, the ones that are handled in bulk, are black oil (Navy special fuel oil), diesel (50 cetane), mogas (80-octane all-purpose motor gasoline), and avgas (100-octane aviation gasoline). Different factors influence the probable increase in demand for each of these products.

Navy special fuel oil is used only for steam ships of the fleet. Merchant ships use Bunker C or other grades, and tremendous quantities of this will be needed for the cargo ships which must keep forces supplied in the Pacific. The Navy's use of black oil is influenced by two factors: (1) the size of the fleet, and (2) the amount of action it sees. The Pacific fleet is due to expand some and the distances it must travel will increase, but with the defeat of the Jap navy—and U.S. Navy men say there's not much left of it now—the amount of battle action and forced steaming will decline. A steamship's fuel consumption increases roughly with the cube of its speed. Thus a capital ship which might burn 700 bbl. per day steaming at 12 knots would use 900 bbl. at 15 knots, 1,200 at 18 knots, 1,700 at 20 knots, and 3,800 at 25 knots.

This article deals only with problems of the Navy, which supplies oil to all naval, land and air forces in the South, Central and Western Pacific areas, including Okinawa, and does not deal with requirements of the Philippines and Southwest Pacific areas under the command of General MacArthur, nor the oil needed for Burma, China, Europe, lend-lease, training, or other military purposes.

Diesel oil is used chiefly in amphibious craft, landing ships, and other small naval vessels, though large quantities are consumed in construction and in shore installations such as refrigeration and power plants.

Use of motor gasoline in the Pacific has been relatively small so far, though the demand would be enormous for a big land operation, say through China. On a land-mass island such as the Marianas or Okinawa, shore-based forces require about ¾ to 1 gal. or mogas per man per month for garrison and maintenance purposes. On an atoll the consumption is only about half this.

Avgas to Rise Rapidly

Avgas consumption is slated to increase fastest of all. Consumption during the first quarter of 1945 was three times that of the first quarter of 1944, and its use is expected to continue upward at about the same rate. Avgas consumption this spring was around 90,000,000 gal. per month in the POA and will increase to 200,000,000 to 270,000,000 gal. per month.

The biggest avgas eater is the B-29. One Superfortress uses more than 6,000 gal. on a single Tokio strike from the Marianas, and can load 8,000 gal. when necessary for specially long trips. It has been disclosed that there are now five B-29 wings operating from the Marianas and that bases are being prepared for more. Each wing normally has 120 planes operational and a 50 per cent reserve, but so good is the maintenance that at times some wings have sent almost all of their 180 planes out on a single strike. The B-29 wing on Saipan alone used 960,000 gal. for a single mission on March 9. In addition to the B-29's, the number of carrier planes, land-based fighters, medium bombers, transports and other types of planes, is increasing, and bases are being prepared in the Philippines and Okinawa for planes released from Europe.

To move all this out to the fighting areas of the Pacific will require the major portion of our tanker fleet.

Tanker operators can get an idea of the requirements from the following factors: A T-2 tanker, the fast, modern type chiefly built during the war and most commonly used in the Pacific, has capacity of 140,000 bbl. but loads only to its weight limit of 15,000 gross tons. Therefore a typical tanker load varies from 100,000 bbl. of fuel oil (at 6.72 bbl. per ton) to 130,000 bbl. of avgas (at 8.8 bbl. per ton). To find the number of tankers required for any operation multiply the number of days in the tanker cycle times the quantity required in millions of barrels and divide the result by four for gasoline, by 3.5 for diesel, and by three for fuel oil.

The tanker turn-around time between San Pedro and the Marianas is about 55 days, which, figuring time laid up for repair, means about 6½ trips per tanker per year. The average turn-around time for merchant tankers in the entire POA is about 60 days, compared with 25 days in fast convoy round trip between the Caribbean and England. Counting time out for repairs and delays the average tanker is in operation only about 320 days per year.

Strenuous efforts are being made to cut down tanker turn-around time. Additional storage and unloading facilities are being installed at all forward bases which will help considerably. What would help even more would be to eliminate deck loads from tankers. Navy men say that the war in the Atlantic was won by using tankers to carry planes, tanks, trucks, landing craft, drummed petroleum products, and all sorts of other cargo. But in the Pacific deckloads cause untold delay because tankers rarely put into a port where there are dock facilities for speedy unloading of deck cargoes.

At present about 40 per cent of the black oil comes from the United States west coast and 60 per cent from the Caribbean, about half the diesel comes from each source, and about 90 per cent of mogas, avgas and lubes comes from the U.S. mainland.

FOUNDED IN 1910

BY PATRICK C. BOYLE

the OIL AND GAS JOURNAL

Constructive Action

PLANS for orderly disposition of surplus oil tankers now taking shape in Congress are heartening. If a realistic working program results, one of the unknown factors in postwar considerations will have been removed. Conversion of the world's war-inflated tanker fleet to peacetime operations has concerned operators in all branches of the industry.

In the first place, the tanker-disposal bill, favorably reported last week by the House marine committee, establishes a priority system for American oil and transportation companies. Second, its provisions are liberal and designed to encourage replacement of obsolete vessels. Third, the base price appears adequate to protect the Government and to discourage speculation on the part of inexperienced operators which might lead to chaotic chartering conditions.

With United States tankers scheduled for completion this year, it is estimated that the American tanker fleet at the start of 1946 will total 1,000 vessels, with deadweight capacity of more than 15,000,000 tons. The number of tankers will be more than three times that of the American prewar fleet, and transportation capacity will be four times greater. All tankers built immediately before and during the war are nearly twice as fast as the older types, with capacities correspondingly greater. Modern tankers are capable of loading 125,000 to 150,000 bbls. of petroleum, an increase of 20 to 50 per cent over a majority of their prewar contemporaries. In contrast with the probable United States postwar position, tanker fleets of other world powers will have shrunk at least 25 per cent from their prewar size.

Great Britain, Norway, Sweden, Italy, France and the Netherlands will be critically short of tankers to resume their respective positions as maritime traders. Also, it is increasingly obvious that certain South American countries, including Argentina, Brazil, and Chile, are interested in establishing tanker fleets under their national flags.

Development of much larger producing and refining capacities in foreign oil countries during the war redoubles the interest in disposition of the American tanker fleet. Oil men are agreed that it would be unwise to "tie up" the surplus tankers. Such a standby fleet serves only to depress charter rates below an efficient operating level and to discourage development. Experience in the first world postwar period convinced everyone of the futility of sustaining many unnecessary vessels.

American ship construction and design were stifled for a dozen years or more because none dared venture into an industry beclouded by hundreds of idle vessels which might be put to sea without warning and at ruinous rates.

The legislation now before Congress provides ways for avoiding the historic postwar pitfalls. Surplus tankers may be sold to foreign countries or their citizens if American interests fail to exercise option within 6 months. The provision appears to offer reasonable protection for American shipping concerns. At the same time, the pending bill contains an escape valve to prevent surplus tankers from strangling the industry indefinitely.

Similar definite arrangements for conversion of the emergency pipe lines to peacetime operations will go far toward clarifying the entire petroleum transportation picture.

INTERNATIONAL

Tropical Seeks to Extend Casabe Pool

Tropical Oil Co., Colombian affiliate of Imperial Oil, Ltd., is drilling below 3,500 ft. at 1 Galan on the De Mares concession, seeking to extend the Casabe pool pay, currently being exploited by Shell Petroleum Co. of Colombia, across the Magdalena River. The Casabe pool is on the west bank of the river, immediately west of Tropical's De Mares property which has been producing for many years.

The Casabe pool, recently established as a commercial shipping field by construction of a connecting pipe line to the Andian National Corp., Ltd., trunk line along the Magdalena River to Cartagena. Forty-two kilometers (26 miles) of the Andian 10-in. line north of Barranca Bermeja were looped recently to provide facilities for handling approximately 8,000 bbl. of crude daily from the Casabe pool.

Two 8-in. lateral lines connect Shell's storage facilities on the west side of the Magdalena with the Andian trunk line. Before this year ends, Casabe pool shipments are expected to rise to 15,000 bbl. per day.

Plans are under consideration, it was reported from Colombia, to replace the existing 10-in. looped Andian carrier with a new 12-in. line after the war. Added capacity by size and efficiency of operation would permit heavier shipments both from Casabe and the De Mares concession.

Small Netherlands Field Discovered During War

Discovery of a small new oil field in the Netherlands which extends across the border at Coevorden under German soil has been disclosed by the Netherlands Information Bureau in New York. The pool is in the northeastern province of Drente and production is obtained from around 2,650 ft.

Fourteen wells have been drilled in the pool, 3 of them in Netherlands territory and 11 on German soil. Production from the pool is currently shipped at the rate of 10 long tons per day (around 75 bbl.), but it is expected soon to increase to 36 tons daily. At present, the entire supply goes to the Hengelo power station in Overijsel province which is generating electricity for the outlying provinces.

It is interesting to note, from a geological viewpoint, reports the Netherlands Information Bureau, that the surface soil around Coevorden is of glacial and preglacial origin. At about 1,050 ft. Cretaceous beds have been found. The preglacial beds are fine sand or loam and occur at depths of from 30 to 66 ft. The glacial top soil is characterized by a thin layer of boulder clay; near Coevorden this layer is only 40 in. thick.

Venezuela Engineer Heads Phillips Land Department

Dr. Carlos Perez de la Cova, formerly director of the department of concessions and cartography, Petroleum Bureau, Ministry of Development of Venezuela, has been placed in charge of the land department for Phillips Venezuelan Oil Co., Caracas. He is a graduate petroleum engineer from University of Tulsa, a member of A.I.M.E. and of the National Association of Engineers of Venezuela. Previously, he received a degree in civil engineering from Central University of Caracas.

Socony-Vacuum Foreign Affiliates Are Active

Foreign operating affiliates of Socony-Vacuum Oil Co., Inc., are currently drilling 14 tests in Venezuela, Colombia and Prince Edward Island, Canada. Two of the Venezuelan operations are in the San Joaquin area, three in the Oficina area and one wildcat test in the Barinas district which is drilling around 4,200 ft.

Colombian affiliates, including Cia. de Petroleos del Valle del Magdalena, Sinu Oil Co. and Colombian Petroleum Co., are operating seven tests, ranging from shallow drilling depths to production-testing levels.

The Prince Edward Island wildcat, 1 Hillsborough, being drilled jointly by Socony-Vacuum and Cities Service Co., has cleaned up a fishing job and is drilling at 12,761 ft.

Increase for Peruvian Production in Prospect

A promise of substantial increases in production and reserves is the result of the International Petroleum Co., Ltd. program in 1944 of deepening and wildcatting in Peru. A total of 77 wells were deepened during the year, and the new initial production developed was approximately twice as great as in 1943. The discoveries resulting from the drilling of successful wildcat wells give promise of adding materially to the proven reserves.

International's Peruvian production was fairly well maintained during the year, with a total of 11,763,083 bbl., as compared with 12,055,908 bbl. in 1943. The decline of approximately 2.4 per cent reflects in part the heavy withdrawals during 1943 to meet war demands, and part is due to the greater emphasis on exploratory drilling in the 1944 program. Sixty-seven new wells were drilled during the year, 48 in the proven area, of which 43 were productive. Exploratory wells totaled 19, with five successes.

Colombian Oil-Law Changes Considered

Seven amendments have been prepared for inclusion in the new Colombian petroleum statute which is currently under consideration by a special session of that nation's congress. The oil bill is supported by those who claim it will remedy the legal ills of the Colombian petroleum industry and promote exploratory and development operations. The seven amendments provide:

1. Regulation of the right to surrender a concession in the light of the technical exploratory findings without the compelling obligation of starting a wildcat test.

2. Lifting of the ceilings of two concessions per person and maximum area of 200,000 hectares. This would eliminate some 100 affiliated oil enterprises doing business in the country, chiefly in name only.

3. Elimination of the so-called "reserved zones" calling for approval of the concession contracts by a law of Congress. This requirement, its opponents assert, delays exploratory drilling.

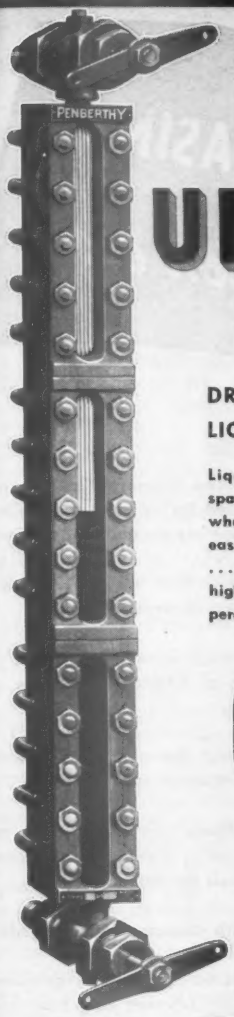
4. Speedier process in the recognition of private oil claims. This would reduce the time lag between preliminary leasing and the start of exploration, a process which currently requires about 2 years.

5. Elimination of the right to attack a concession by alleged private oil owners. Privilege of contesting concessions currently may be exercised any time within 2 years after companies have assumed exploratory and drilling obligations.

6. Right to amend or correct concession applications without losing priority in the application. Under the existing law a technical detail may cause loss of application and concession rights.

7. Provides for a higher depletion deduction for income-tax purposes. Currently the deduction is limited to 5 per cent of the net income.

XUM



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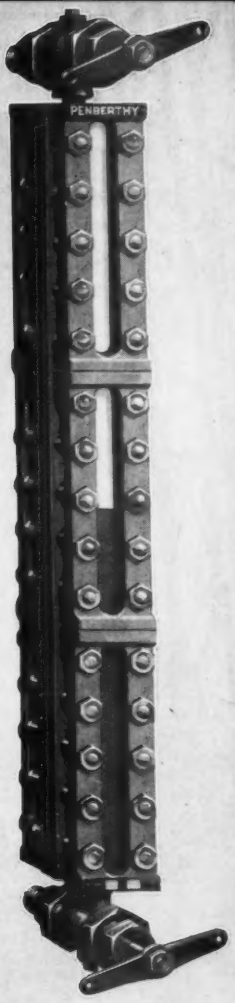

PENBERTHY
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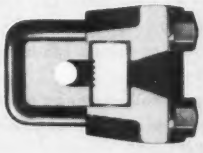
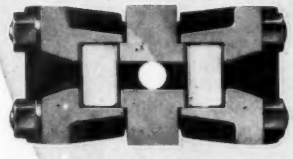
DROP FORGED STEEL LIQUID LEVEL GAGES

Liquid shows black—empty space shows white. Preferred wherever liquid level must be easily and positively visible . . . and when liquids are under high pressure or at high temperature.



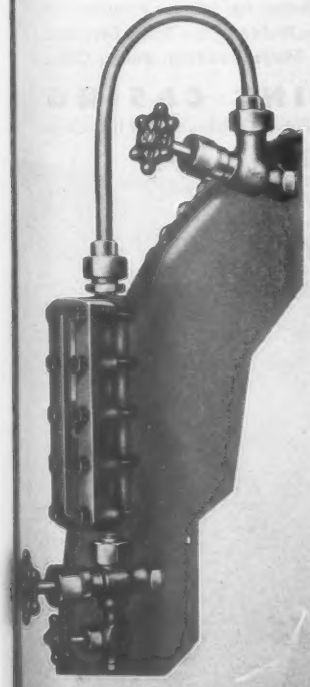
PENBERTHY
Transparent
DROP FORGED STEEL LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures, and/or temperatures. Construction is exceptionally rugged . . . similar to Reflex types.



Penberthy Liquid Level Gages

ALL PENBERTHY GAGES CONFORM WITH A. P. I.—A. S. M. E. REQUIREMENTS

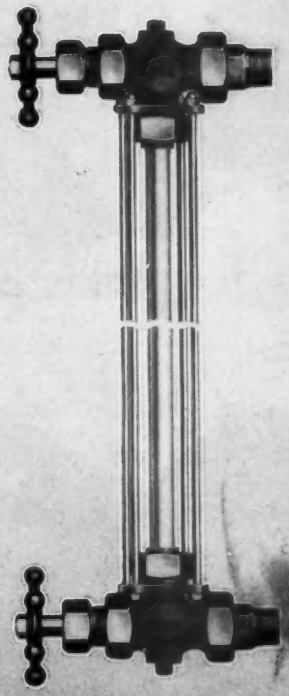


PENBERTHY
Reflex
WATER GAGE SET

Water shows black—steam shows white. U-bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler.

PENBERTHY
DROP FORGED STEEL LIQUID LEVEL GAGES

Made of Chromium-molybdenum alloy temperature-resisting steel, extra heavy throughout. Stainless steel trimmed. Tubular glass type gages also available in various other metals suitable for practically all conditions.



PENBERTHY INJECTOR CO.

DETROIT, MICHIGAN • Canadian Plant: Windsor, Ontario

PENBERTHY

6 REASONS WHY THIS CASING Saves time, cuts installation costs

Field men who use ARMCO Spiral Welded Slip-Joint Casing know that it has many advantages when used for oil and gas wells. It saves time, labor and handling costs. Here are six good reasons why:

1. *CHOICE OF WALL THICKNESS*

You can choose the correct wall thickness from 3/16 to 1/2-inch to get maximum footage from each ton of metal used.

2. *STANDARD 40-FOOT LENGTHS*

This makes it easy to determine the footage in the well and in the stockpile. The standard 40-foot lengths of ARMCO Casing are cut to a tolerance of plus or minus 1/8-inch.

3. *PERFECT LINE-UPS*

Square-cut ends and collars mean perfect line-ups. A down-hand fillet weld position assures a strong, uniformly welded string.

4. *RESISTANCE TO COLLAPSE*

The spiral weld construction imparts stiffness and resistance to collapse—helps assure straightness when casing is set. Added strength is achieved by cold-forming the steel when the casing is made.

5. *FASTER FIELD WORK*

Derrick work is speeded. Special line-up clamps are not needed.

6. *EXCELLENT FOR WELDING*

ARMCO Casing is made from steel selected for welding qualities. Field welding is easy. Joints are quickly lowered into mud and water without dangerous hardening or cracking of the weld.

Try ARMCO Spiral Welded Casing. It meets wartime demands for speed and efficiency. Write our distributor for full information—or Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 2551 Curtis St., Middletown, Ohio; 501 Mayo Building, Tulsa, Okla.

ARMCO SLIP-JOINT CASING

Distributed by The National Tank Co., Tulsa, Oklahoma and branches.

ARMCO

OPA Defends Oil-Price Policy In Memo to Senate Committee

WASHINGTON.—A defense of the price treatment given the oil industry by the Office of Price Administration has been filed with the special Senate committee on petroleum resources by Orville D. Judd, associate director of the Fuel Division of OPA.

Judd's statement was made in answer to the testimony of Walter S. Hallanan during hearings on obstacles to maximum crude production and exploration. Judd said that Hallanan accused OPA of unfair treatment of the oil industry, and maladministration of the law as laid down by Congress, and contended that the stripper-well premium plan is a failure and the independent segment of the industry is being liquidated.

The use of replacement cost as a basis for price ceilings was suggested by Hallanan, and Judd told the committee this method is not justified because replacement cost is not an established accounting practice in the oil or any other industry, if applied to all industries would result in inflationary prices, and is not an important factor in exploratory drilling.

In support of the statement that the independent operator is still a factor in the oil business Judd pointed out that in 1944 independents drilled more than half of all exploratory wells and more than they drilled in 1941, and that if they are selling their properties to others the prices received show that such liquidation is not painful. He added that in the current cost study questionnaire OPA found that the number of new operators added to its mailing list was greater than the number who went out of business during the past year.

Subsidy Acceptance Cited

The stripper-well subsidy plan was not hastily conceived and has been working well, Judd asserted, and filed with the committee six telegrams refuting Hallanan's criticisms of the plan. These were signed by Howard J. Whitehill, president of the National Stripper Well Association; J. D. Sandefer, Jr., former president of the N.S.W.A.; Charles F. Roeser, Fort Worth producer; Fred Sherman, vice president, North Texas Oil and Gas Association; W. J. Brundred, Central Pennsylvania Oil Producers Association, and M. E. Daniel, president of First National Bank of Breckenridge, Tex.

"The present average price of oil in the United States," Judd declared in his statement, "is at its highest level since 1929. Reserves at the close of 1944 as estimated by the American Petroleum Institute amounted to 20,453,231,000 bbl., the highest reserve level ever recorded. Exploratory wells drilled in 1944, according to the Petroleum Administration for War, numbered 3,881, a sizable increase over 1943 when 3,512 were drilled and a considerable increase over 1937, the first year when any records were kept separating development and wildcat wells, in which year 2,224 were drilled. The total wells drilled in 1944 amounted to 24,154 wells, an increase of more than 5,000 over 1942 and 1943 levels. While the total of both exploratory and development drilling each year, 1942 through 1944, was less than in prewar years, the 1944 total is very impressive when due consideration is given to the fact that manpower and materials have been extremely critical and that the Petroleum Administration for War placed in effect in December 1942 drilling restrictions which seriously curtailed the drilling of developmental wells. In 1944 the total producing wells in this country numbered 412,851 or the highest number recorded by industry in the history of the oil business. In that same year abandonments amounted to 7,875 wells as compared with 9,217 in 1943 thereby indicating, we believe, that the stripper-well premium plan was showing its effects. Moreover, the 1944 rate of abandonment was substantially lower than most prewar years.

"Ceilings No Impediment"

"On the basis of the figures just enumerated it would appear that the ceiling price of crude oil has constituted no impediment whatever to the progress of the industry.

"We firmly believe that the oil industry generally needs no artificially inflated price to use as a springboard for postwar years. We do not believe that a fictitious factor such as replacement cost should be introduced into wartime pricing when the economic well-being of the nation, both during and after the war, is at stake. We feel that the premium payment plan has served a definite beneficial purpose and that the statements, on the part of some of the oil industry, that the industry objects to subsidies is not factual. We believe that the industry has for years enjoyed the benefits of subsidy in other forms."

OPA to Study Incomplete Data on Producing Costs

WASHINGTON. — An incomplete set of returns to its crude-oil-cost study is being analyzed this week by the Office of Price Administration, and the tabulation will be submitted to the industry advisory committee shortly.

After moving up the deadline for returns to the questionnaire several times, OPA has decided to go ahead on the basis of its June 30 returns which represent a small percentage of the producers originally asked to submit their cost data. Whether the agency will make its determination on the basis of the questionnaires returned is undecided, but the industry committee will have an opportunity to protest a decision, if it wishes, based upon the small sample available.

At the same time, OPA has completed a questionnaire for refiners and has submitted it to the refinery industry advisory group. The need for a refinery-cost study rests to a large extent upon the results of the crude-oil survey. OPA will urge, however, that the refinery survey be complete to determine the ability of refiners to absorb a possible price raise in crude oil.

Agency Accused of Violating Price Law

CHICAGO. — Charles E. Paden, owner of Lubri-Gas Laboratories, Chicago, and Clovis Rankin, owner of Home Oil Co., Stafford, Kans., in a protest filed by Attorney Eugene C. O'Reilly, Chicago, with Administrator Chester A. Bowles accuse Office of Price Administration of violating Price Control Act in establishing premium-grade ceilings.

The protest asserts that gasolines processed with Lubri-Gas were sold long before the war at premium prices and as a result OPA's order, which in effect forbids a premium price for gasoline so treated is unfair. A hearing by an OPA board of review is requested.

O'Reilly says injunction suits have been filed by OPA in United States District Courts in several parts of the country against dealers in Lubri-Gas and by reason of the fact that the United States Emergency Court of Appeals was established by Congress to interpret and pass upon the legality of regulations of the OPA, those dealers are precluded from setting up matters of defense in the injunction suits which are eventually to be determined by the Emergency Court of Appeals.

XUM

Petroleum Deliveries to European Army Disclosed

WASHINGTON.—Between D-Day and V-E Day the Transportation Corps imported and delivered 1,645,-145,840 gal. of POL (petrol, oil, lubricants), an average of approximately 5,000,000 gal. a day, to depots and air bases on the continent of Europe.

Gasoline has shared top priority on shipping space with ammunition since June 6, 1944. Gen. George S. Patton, Jr., commander of the U. S. Third Army, once said that at times gasoline was more important to his outfits than food.

One of the world's most famous supply lines, the "Red Ball Express Highway," earned world-wide recognition when it was hauling gasoline to the Third Army's tanks during their dash across France.

Vital importance of gasoline to the current war was shown when the highly mobilized German Army of 1939 was virtually brought to a standstill in 1944-1945 when the Twelfth Air Force knocked out their petroleum facilities.

More than 80 per cent of the European total was composed of 80-octane fuel, the type commonly used by American automobiles, while the remaining 20 per cent was three-fourths aviation gas and one-fourth lubricants and oil.

After arriving on the continent the POL moved forward through three main pipe lines running from Cherbourg to Mainz, Antwerp to Wesel and Marseilles to Mannheim. When the POL arrived at the pipe heads, through the 3,600-mile intricate system, it was loaded into tank cars and jerricans and moved forward by train to railheads at Nurnburg, Hanover, and Munich, from which point it was taken to depots by motor transport.

All the pipe line used by the American Army in this theater was constructed by the Military Pipelines Service of the Engineers.

O'Mahoney May Resume Hearings on Pipe Lines

WASHINGTON. — Hearings before the O'Mahoney Senate committee investigating petroleum resources may be resumed earlier than previously announced, it was hinted here this week because of the postponement in scheduled adjournment of Congress.

The next topic to be presented before the committee deals with disposition of government-built pipe lines, one the most vital problems confronting the industry. Multiple plans have been advanced informally for conversion of the two emergency pipe lines to natural-gas service from the Southwest to the East Coast. Some advocate sale of the lines to private industry for continued movement of crude and products. Others suggest continued government ownership with facilities maintained as a reserve against future emergencies.

Another Serpentine Discovery for Cuba

A new serpentine discovery well was reported completed late last month near Jatibonico, Cuba, but details on volume of crude oil or depth have not been disclosed. The well is about 30 kilometers (20 miles) southeast of Jarahueca, the newest pool in Cuba.

More than 30 drilling rigs are currently active in Cuba's two producing fields. Twenty rigs are drilling in the Motembo field where serpentine production is obtained at shallow depths, ranging from 600 to 1,800 ft. The Motembo field currently produces about 200 bbl. of high-gravity naphtha from an estimated total of 200 productive wells. More than 1,200 wells have been completed in the field, indicating that about 1,000 former producers have been abandoned as they were exhausted.

Twelve rigs are active in the Jarahueca field which currently produces approximately 400 bbl. daily of 45° A.P.I. crude which sells at the well head for $5.04 per barrel. The pool contains 25 producing wells, three failures have been drilled and three wells which at one time produced have been abandoned, making a total of 31 completions through end of June. There are five individuals or companies active in Jarahueca operations, including: Antonio Mondez, Antonio Mendez (Caribe), Petrolera Jarahueca, Parker "Iris" and Vieites "Regina."

Jarahueca wells are completed at average depth of 1,500 ft. and the deepest test drilled to date was carried to 2,500 ft. The average casing program at Jarahueca consists of: 80 ft. of 15½-in., 60-65 lb. pipe; 200 ft. of 12½-in., 45-lb.; 600 ft. of 10¾-in., 40 lb.; 1,200 ft. 8¼-in., 24-lb., and 1,500 ft. of 6¼-in., 20-lb. pipe. Cost of completed producing wells averages around $5,000 to $6,000.

Approximately 200 bbl. daily of Jarahueca pool production are refined in the field by Petrolera Jarahueca which has a small skimming plant, consisting of two oil or gas-fired stills, suitable for a simple topping operation. Another 100 bbl. per day are trucked from the field and sold directly to consumers or blenders. Some of the pool's production is moved to Havana and is refined at Bacuranao.

Share Your Journal With a Service Man

This issue of The Oil and Gas Journal can be mailed to any service man in the United States for 6 cents.

Due to weight restrictions, it cannot be remailed to an APO or Fleet address unless requested by a service man.

DEATHS

Clyde Bentley, 42, welder foreman for Sinclair Prairie Oil Co., and **Dale Young,** 23, assistant welder, died July 2 of burns suffered in an oil pipe-line explosion near Archer City, Tex. Both resided at Olney, Tex.

B. D. Jordan, 67, one of the developers of the Arcadia oil pool in Oklahoma County, Oklahoma, died July 4 in Hugo, Okla.

H. V. Hays, 56, assistant credit manager for The Texas Co., died in Houston July 1.

Capt. Clifton A. Croom, employed in the civil engineering department of Humble Oil & Refining Co., Houston, before he entered military service, met death October 24, 1944, when the Japanese prison ship on which he was being transferred from the Philippines was torpedoed, the War Department has notified relatives. Captain Croom, who graduated from North Carolina State University in 1936, was a survivor of the Battle of Bataan, the Death March, and 2 years in Cabanatuan Prison Camp No. 1.

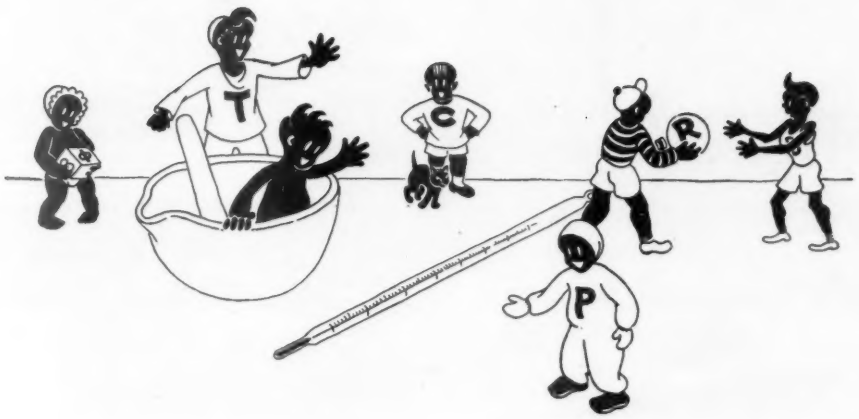
C. O. Rison, about 60, former general superintendent at Oklahoma City for Indian Territory Illuminating Oil Co., died July 6 while being taken to a hospital in that city.

James E. Carnahan, 65, Dubberly, La., for the past 36 years district foreman for Gulf Refining Co., died July 5.

T. B. Wrather, 60, independent oil operator, died July 6 in Kilgore, Tex.

Arch I. Watson, 69, retired oil man, died July 1 in Wichita, Kans. Watson had served as production superintendent for Tom Johnson Oil Co. and for the old Prairie Oil & Gas Co. He was superintendent for Winkler-Koch Engineering Co. at the time of his retirement in 1939.

XUM



Test Tube Baby #7
Alkylation

The birth of this test tube baby proved that paraffin hydrocarbons are not inert as has been taught. UOP chemists discovered that paraffins reacted with olefins to produce alkylate — the most important component of aviation gasoline. This is the basic reaction used in many commercial alkylation plants.

CATALYTIC CRACKING	*THERMAL CRACKING*	*RETREATING*
CATALYTIC REFORMING	*THERMAL REFORMING*	*POLYTREATING*
HYDROGENATION	*HYDROFORMING*	*U. O. P. CATALYSTS*
ALKYLATION	*DEHYDROGENATION*	*UNISOL TREATING*
ISOMERIZATION	*POLYMERIZATION*	*U. O. P. INHIBITORS*

Universal Oil Products Co.
Chicago 4, Ill., U. S. A.

UOP

Petroleum Process Pioneers
For All Refiners

The Refiners Institute of Petroleum Technology

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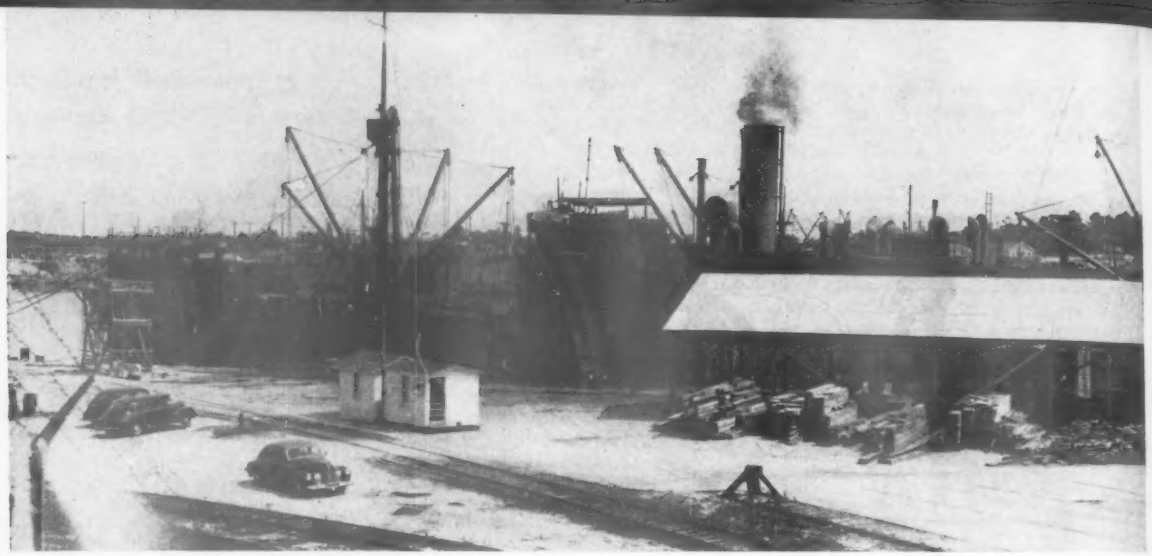
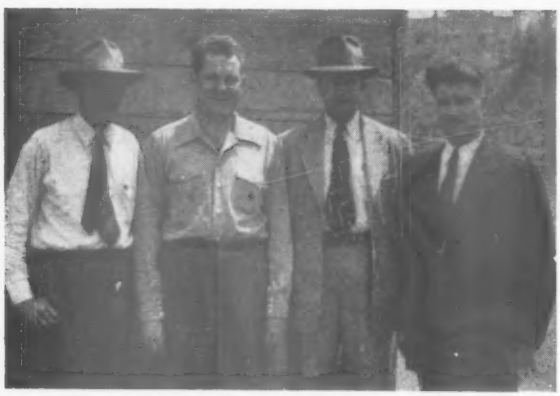


Lee Construction Co. plant site, Houston Turning Basin. Loading of boat in background, which required 3 days, has been completed

Technical Export-Crating Skill Insures Undamaged Delivery Of Rotary Rigs



W. S. Stout, George P. Livermore, Inc., A. D. Lee, Lee Construction Co., R. C. Tucker, vice president George P. Livermore, Inc., and M. J. Garcia, Chilean government oil company

The preparation of heavy oil-field material for export is a job for specialists. Here's the story of a recent shipment of a complete rotary rig and spudding unit to Chile

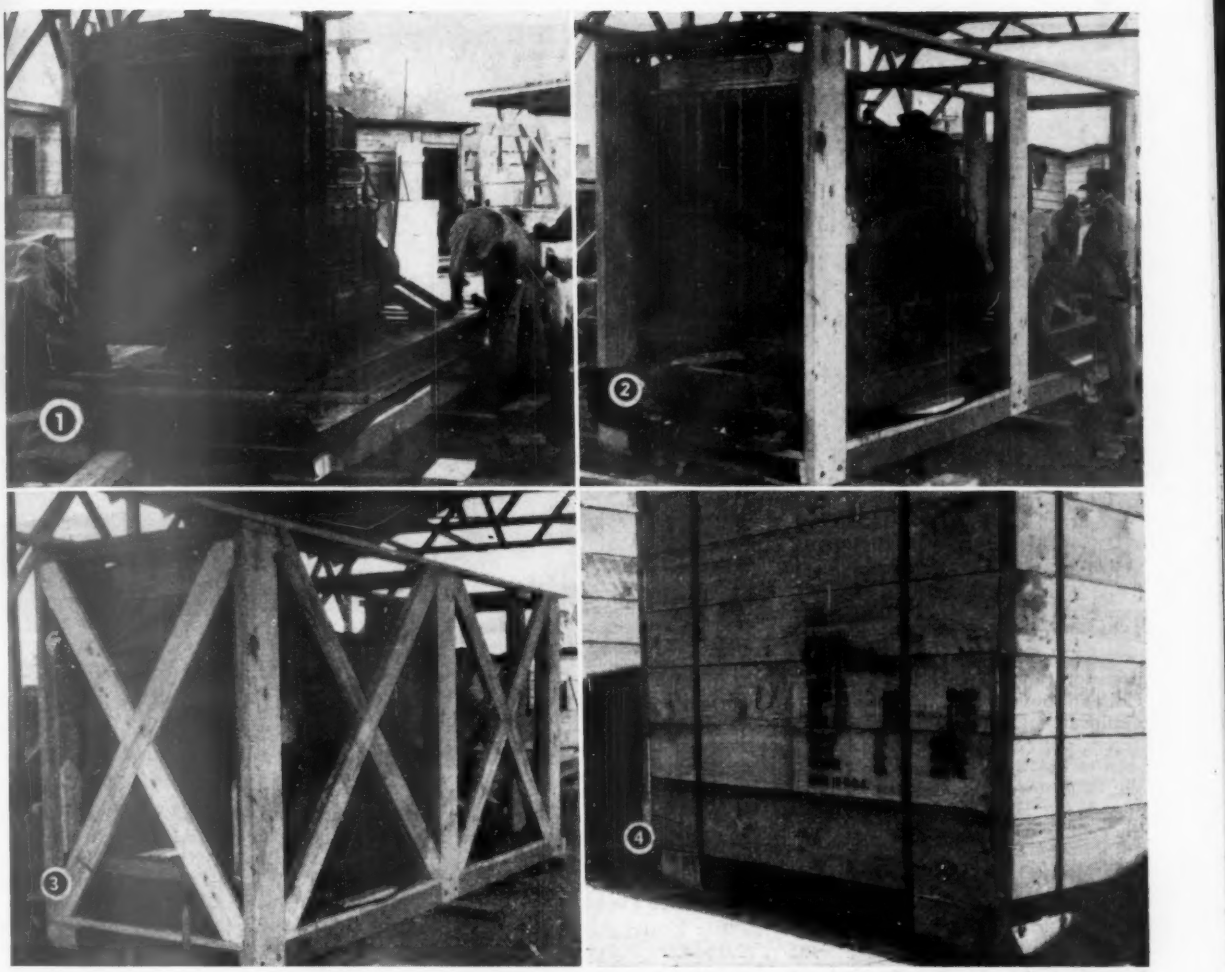
by E. H. Short Jr.

PARTS IN A TYPICAL RIG SHIPMENT

- Plug valves
- Belts
- Overshot
- Cathead
- Subs
- Fishing tools
- Turnbuckles
- Kelly
- Float equipment
- Mud materials
- Mud-testing equipment
- Wire line
- Elevators, links, and hook
- Diesel engines
- Compressors
- Fire-fighting equipment
- Lanterns
- Slush pumps
- Spudder
- Spinning-line cathead
- Swabs and oil savers
- Pipe straightener
- Measuring device
- Tanks
- Pump liners
- Hose
- Casing spiders
- Pipe trailers
- Formation-testing equipment
- Bits and flash-weld tool joints
- Pumping unit
- Blowers
- Transmission bearings
- Rotary
- Motors
- Water-well jack
- Substructure
- Trucks
- Weight indicator
- Snatch blocks
- Sand pump
- Valves, rubbers, and pistons
- Derrick
- Casing
- Drill pipe
- Blowout preventer
- Swivel
- Flanges and drilling valves
- Brake
- Wire-line guides
- Bits
- Core barrels
- Crown block and traveling block
- Power take-off bearings
- Instruments
- Shale shakers
- Draw-works bearings
- Chain tongs
- Mazda lamps
- Draw works and transmission

THE export shipment of drilling equipment, in the case of any one oil company, occurs at rather widely spaced intervals of time, so that under ordinary circumstances it is not considered economically feasible to conduct, first, the necessary engineering investigation, and then to maintain the trained personnel necessary for expertly preparing heavy equipment for export shipment to distant countries.

The recent development of a highly successful technique in crating rotary rigs and other heavy oil-field equipment for foreign shipment comes at a time when there is a great deal of discussion among both oil-company and manufacturing officials concerning the vast shipments of oil-field equipment and materials which will be required in the very near future for reclaiming war-devastated oil fields and carrying out postwar exploration and exploitation



1—Diesel engine just placed on skids. Note felt paper under engine to make box waterproof. 2—Uprights in place. R. C. Tucker at right inspects work. 3—Box completely braced ready to be closed as soon as felt paper is put in place. Engine has been sprayed with rust ban. 4—Box completed—total weight 20,000 lb. Note steel strapping

work in various parts of the world.

Some of this work has already begun, and during the past year the crating methods employed by Lee Construction Co., Houston, have been responsible for the undamaged delivery of millions of pounds of heavy oil-field machinery and equipment to Venezuela, Colombia, Chile, Brazil, Trinidad, and Egypt.

Many in the oil industry, who have never been confronted with the problems involved in preparing heavy oil-field material for export, have no conception of the work involved. Some who have ventured a guess indicated that the bare equipment might be trucked or shipped to the dock and then picked up by the ship's hoist to be neatly stored in the hold—very much in the same fashion that a contractor might temporarily rack a rotary rig in his warehouse yard. No guess could be more erroneous. This article, therefore, is to acquaint those who may be confronted with export preparation of heavy equipment in the future with the manner in which such work is done.

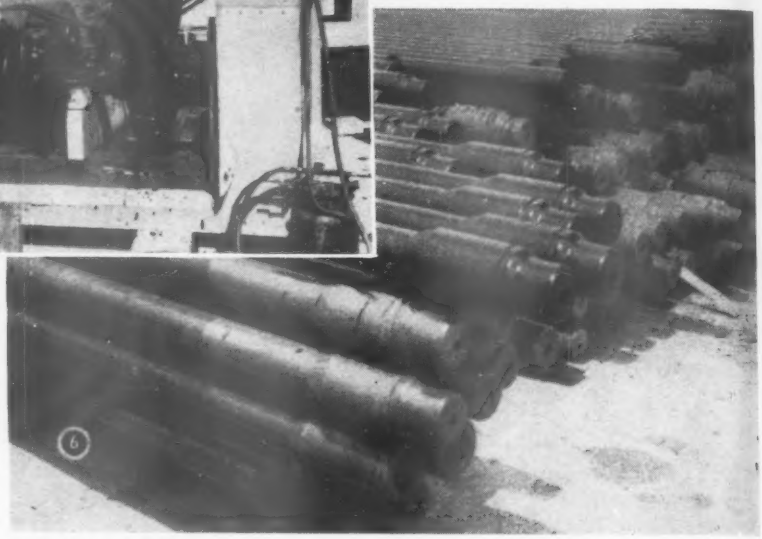
Specialized Service

The service performed by the Lee company is used to describe export crating, since this is the only company of this kind operating on the Gulf Coast. The work done by this company is unique in several respects, and operators and manufacturers alike have expressed satisfaction that the preparation of heavy oil-field equipment for export has now advanced to a highly specialized plane of technical service. While a few manufacturers of rotary equipment have developed very satisfactory export-crating methods, many of the rotary-drilling rigs assembled on the Gulf Coast for export are composed of a multitude of different makes of equipment, and in some instances the crating problem might involve a rig which already has operated in this country.

A number of oil companies, therefore, have welcomed the opportunity to place the entire responsibility upon a firm which specializes in preparing heavy oil-field equipment for export. The Lee company handles all material, labor, moving, and unloading equipment from sidings and on to barges and ships after performing the crating service. In addition to this, from 18 to 27 duplicate packing slips are prepared by the office staff for each crate. The slips must show a complete description of the material, dimensions of crate in both inches and centimeters, and weight in both pounds and kilograms, and also export permit and code data. In some instances, this company has been given the responsibility of locating and buying the trucks, cars, and tractors needed for export.

Recently, George P. Livermore, Inc., of Lubbock, Tex., delivered a complete rotary rig and spudding unit for export preparation to the

5—K. Morris spraying with rust ban, parts of spudder machinery. This has been dismantled and reassembled for crating. Note lag screws and slots for steel banding. 6—The shipping methods for drill pipe. Top layer has just been covered with rust ban. This does not require crating



Lee company's plant located on the Houston Ship Channel turning basin. This equipment was prepared for export to Punta Arenas, Chile, which is at the extreme southern end of South America. The Livermore corporation has been selected by the Chilean Government to drill several exploratory wells on the Island of Tierra del Fuego. The spudder was sold to the Chilean Government and the cable-tool work will be conducted on the Brunswick Peninsula on the east side of the Andes Mountains.

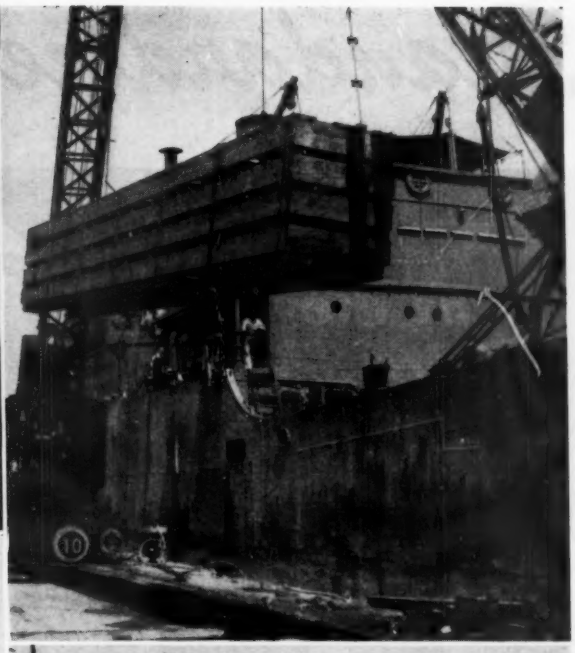
Many Transfers En Route

As an idea of the handling to which this equipment will be subjected: It will be unloaded at Valparaiso, Chile, after a trip of approximately 4,000 miles from Houston, and then reloaded aboard a lighter to complete the journey to Punta Arenas, a distance of approximately 1,400 miles. From Punta Arenas, the equipment will be taken across the Strait of Magellan to Tierra del Fuego.

The total weight of the equipment crated for shipment to Chile amounted to approximately 1,250,000 lb., and required 6 weeks to complete the crating job. The total weight of a number of the heavier individual crates and material within amounted to some 50,000 lb. The size of the crates ranged from 3 by 3 by 4 ft. to 44 by 12 by 12 ft. The tremendous size of boxes of the latter dimensions should be fully appreciated—many oil-field families have been raised in box-car houses smaller than this huge crate.

The method employed by the Lee company in crating heavy material

7—Inside of Livermore designed utility house containing: Generator, motor, air compressor and tank, and water pump. Also storage house for lubricating oil and gasoline. 8—Uprights in place on utility house with workmen placing first panel boards



9—H. S. Drumright, manager, Lee Construction Co., examines box containing pump parts. 10—Substructure of derrick being loaded aboard steamer. 11—Drilling mud additives packed in box which is completely waterproof. Note location of steel strapping—also heavy skids. 12—Substructure of derrick. In foreground can be seen the beginning of another crate, which shows uprights and bracing

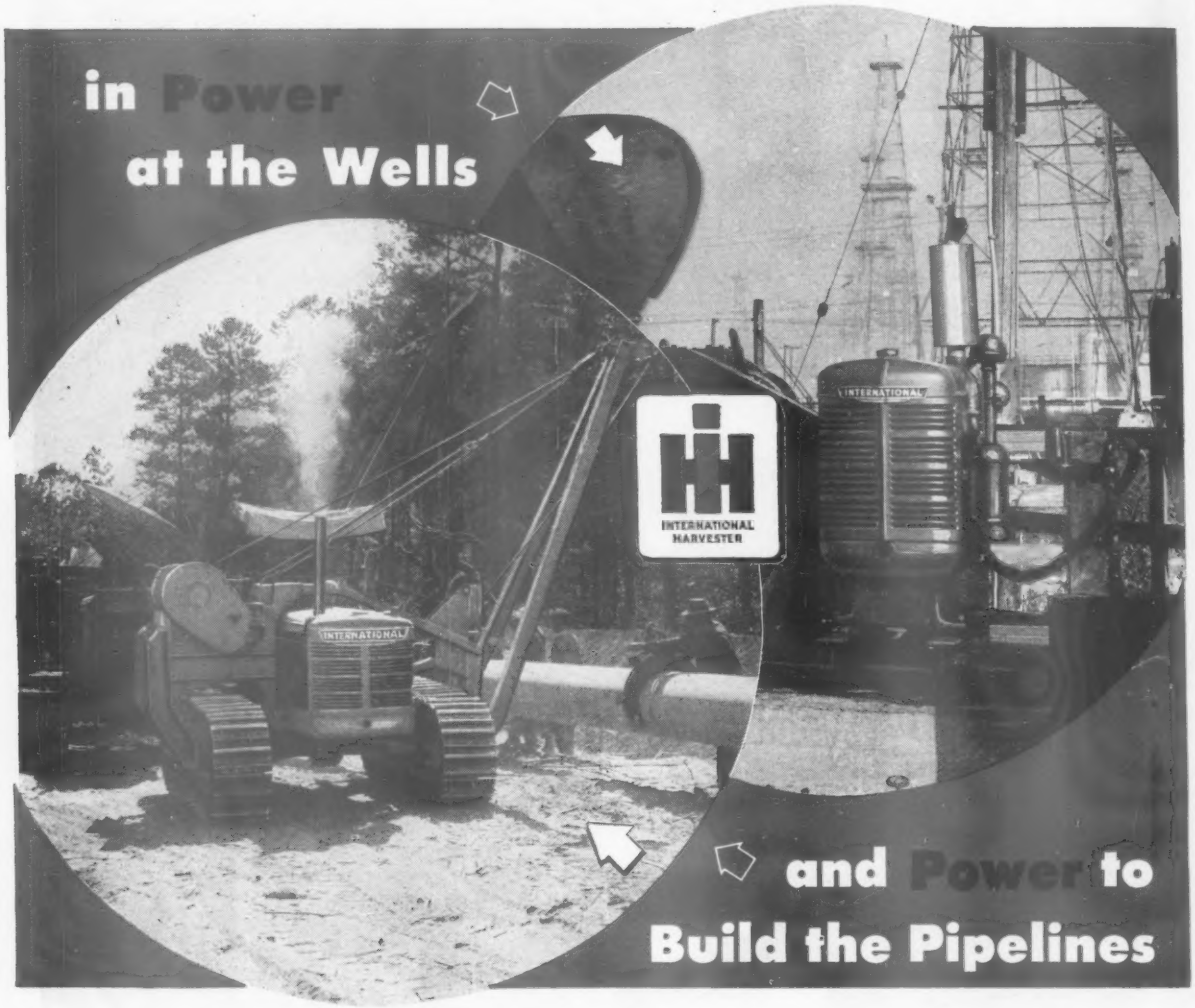
is the result of an extensive investigation of the engineering principles involved in construction which must be taken into account if maximum crate strength is to be obtained. The company's investigation also included the compilation of data pertaining to the greatest amount of handling and the transportation stress to which export materials might be subjected in shipments to the most remote parts of the world.

The selection of material for use in crating is expertly made, because high-quality lumber is the first requisite for obtaining maximum crate strength. There is, however, another reason why extreme care is taken in the selection of lumber, and that is to permit its use (when the crates have reached their destination) for derrick floors, camp houses, cement and mud sheds, etc. The lumber used in crating is free of duty, and in many parts of the world, where this material is a costly item, the use of crating lumber for subsequent drilling facilities represents a substantial saving. In the recent shipment high-quality fir was used because this lumber satisfied the 45-ft. length requirement.

While each crate is designed for the particular piece of equipment to be prepared for shipment, some of the construction methods developed by the Lee company have played such a large part in the undamaged delivery of equipment, that they have become standard with this concern. A comprehensive conception of the methods employed may be conveyed best pictorially.

In looking over the many illustrations, particular attention should be directed to the ones showing the method of strapping each crate. It will be noted that strong steel bands (1¼ in. in width and .035 in. thick having a tensile strength of 100,000 psi.) are pulled tightly around the crates at several points, depending upon the size of the crate. It should also be observed that the manner of

Standardize on Stamina



DAY-IN and day-out operation under all conditions requires rugged dependability in power units. Throughout the petroleum industry, operators are finding that ruggedness and dependability are another way of saying International. More and more they are standardizing on International stamina.

For power at the wells, International Industrial Power Units have proven themselves to be tops for economical and dependable performance.

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That's why it pays to standardize on International. You'll find that you are standardizing on stamina. See the International industrial power distributor or dealer for complete information.

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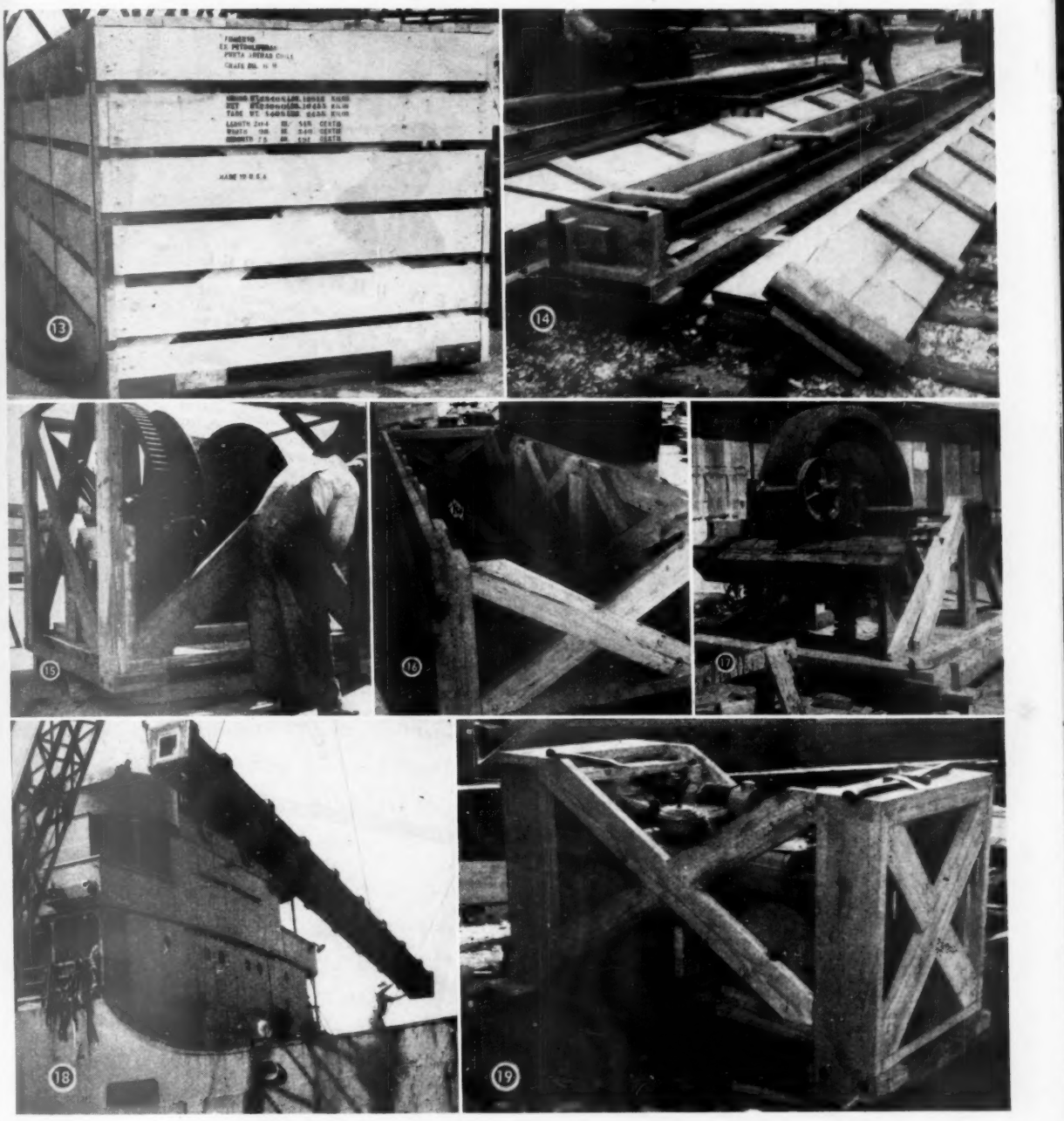
INTERNATIONAL Industrial Power



13—Slush-pump crate complete. Gross weight 28,408 lb. 14—Collars and kellys being placed in crate. They have been covered with rust ban and are strapped together with steel banding on the inside of crate, and strapping will be pushed around outside of box. 15—Spudder reel. Note bracing and bolts in uprights. 16—Inside of box to be filled with valve fittings. Note braces and heavy construction. 17—Start of spudder and bandwheel and shaft crate. 18—Kelly and drill collars being loaded on ship. Crate is 45 ft. long and weighs 12,000 lb. 19—Pump unit braced and secured

running and strapping through the skids prevents damage to the banding while the crates are being handled. The method of placing cross braces, of protecting all equipment with rust ban, and the waterproof felting used inside the crates, are some of the extremely important features brought out in the accompanying illustrations.

In addition to the Houston plant, the Lee company maintains similar facilities in Fort Worth and New Orleans. While the company was conceived and developed solely to serve the oil industry, the owner, A. D. Lee, says that the company specializes in handling the unusual and in performing the seemingly impossible tasks, so that at the present time his staff is making preliminary calculations on the immense problem of crating an entire steel mill, and also a complete textile mill, for export.

Hugh Key, who was district landman at Shreveport for Mid-Continent Petroleum Corp., has been transferred to the Tulsa office. **Myrl Mannschreck,** formerly landman at San Antonio, has been shifted to the Shreveport assignment.

XUM

WE RENEW OUR PLEDGE

Two years ago, at the beginning of the present war with its uncertainties and threats to the future of all industry, this Company publicly pledged itself not to increase its selling prices.

On this, the second anniversary, we again publicly renew that pledge.

During the last two years we have not only kept the pledge previously made, but *we have actually reduced our selling prices by more than 6%* because of more efficient operation made possible by the marvelous cooperation and ability of our organization. This was accomplished in the face of rising labor and material costs, both of which have been increased by considerable amounts.

It is our belief that the only hope for the continuance of the present industrial system now threatened from within and without is in its ability to give more and more to the consumer for less and less of his dollar. This is the strength of American individual initiative. This is the hope of our country's future. If American industry can accomplish this universally, we need not fear dictators either at home or abroad.

THE LINCOLN ELECTRIC COMPANY

Cleveland, Ohio
October 2, 1941

J. F. Lincoln
President

OCTOBER 2, 1941

STATEMENT OF POLICY

The world is entering a crisis, the result of which no one can foresee. Other wars have brought inflation, followed by unemployment and depression after peace was achieved. America's experience in the World War illustrates this fact.

Much of this post-war trouble would have been eliminated by a more foresighted price policy on the part of manufacturers and distributors. Price inflation by the seller when he had a dominant position resulted inevitably in reaction with deflation, depression and suffering. Many of those price increases were not warranted.

Before such an inflationary cycle of prices is again started, we publicly pledge ourselves, as far as possible, to maintain present prices.

Further, if the materials we buy are increased in price, or the cost of labor is increased, then we pledge ourselves to raise selling prices no more than the bare increase in cost of raw materials and labor going into our products.

Further, we pledge ourselves to pass on to our customers the reduction in cost made possible by better manufacturing methods, wider distribution and technical advances in production.

THE LINCOLN ELECTRIC COMPANY

Cleveland, Ohio
October 2, 1939

J. F. Lincoln
President

OCTOBER 2, 1939

★ ★ OUR PLEDGE MAINTAINED ★ ★

On October 2, 1939, we announced the policy of "no increase in selling prices". A progress report made October 2, 1941, showed we actually had reduced prices by more than 6% during the period 1939 to 1941.

We have adhered to this policy of price reduction throughout the war years. Despite general increases in the costs of labor, materials and distribution . . . and despite governmental regulations . . . we have been able to maintain or reduce our prices throughout the entire period from 1939 to date.

This has been made possible by our incentive system . . . a method which, if it had been applied throughout industry, would have doubled America's output of war goods for a quicker Victory and would have cut the cost of the war by 50%.

America's future depends largely upon her *efficiency of production.* Our proved incentive system has in it the seeds of a satisfactory answer to the difficulties of this nature in industry.

THE LINCOLN ELECTRIC COMPANY

Cleveland 1, Ohio
May 7, 1945
Victory in Europe

J. F. Lincoln
President

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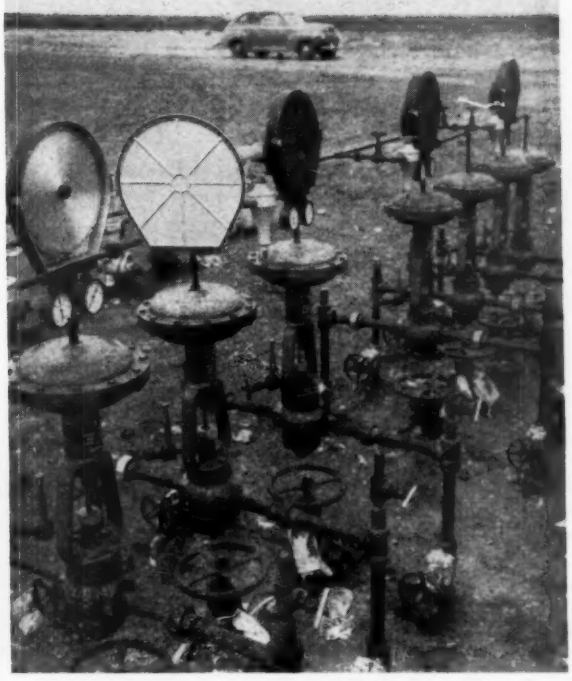


Fig. 1—(Left) Seven of the eight wells connected to this tank battery are automatically controlled to selected rates which give minimum gas-oil ratios. Clocks in cam housings are of the 7-day-wind type. Fig. 3—(Right) Timing disk inside the case has three concentric circles of holes. Contact of pins set in any of the center holes closes both valves. Pins set in other rows open one or the other valve. Total of 180 settings per circle gives time cycles as short as 8 minutes; longer periods are multiples thereof

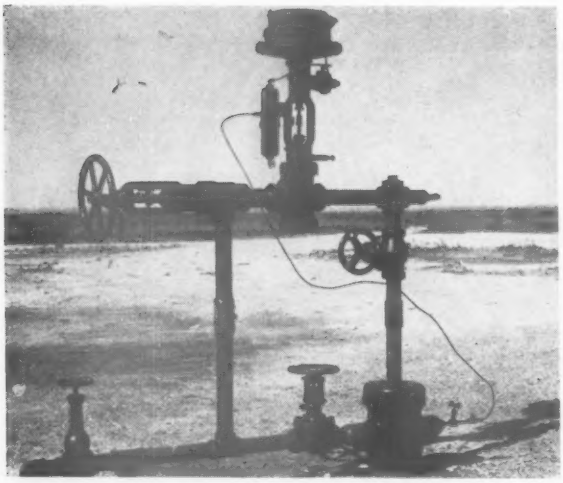
Automatic Well Controls And Two-Stage Separation Have Quick Payout

by Kenneth B. Barnes

MOST efficient utilization of manpower, and maximum conservation of oil and gas are two cardinal objectives of petroleum engineers. These aiming points, however, are not rare or infrequently occurring instances where one must have a brand-new oil pool in a solid block before there is occasion to start in. The automatic flow-controller installations and two-stage separation hookups described here are simple examples of that fact.

The controllers are of the time-cycle intermitter type and accomplish two things: (1) permit the allowable production from the wells to be flowed at rates which yield the lowest gas-oil ratios, and (2) allow the field operating force to do other work that cannot be coped with mechanically and automatically. The separation hookup given covers a good illustration of two-stage gas liberation from crude oil. The system includes manifolding for gaging individual wells through a test separator, and a regulated takeoff of high-pressure gas for fuel for drilling rigs and other purposes. In use, withdrawal of reservoir oil has been

Fig. 2—One time-cycle controller operates two motor valves, each on a different lead line. When one well of the pair is flowing, valve for the other is closed. No valve is installed for fourth well, which is temporarily closed in



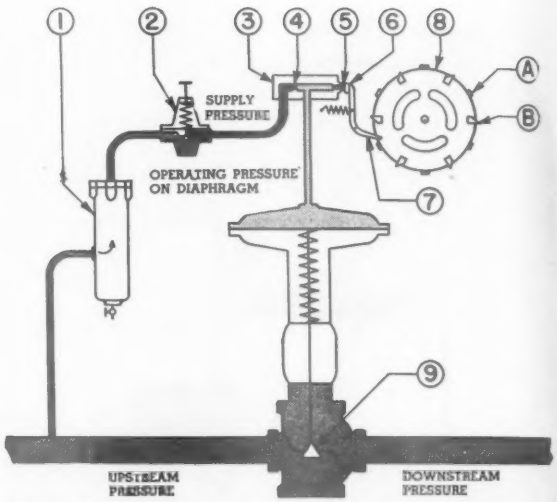


Fig. 4—(Left) Time-cycle intermitter on a flowing well at Maljamar. The equipment forms an important part of the pressure-maintenance program there. Savings in gas-compression costs alone, by reducing gas-oil ratios, can be $146 per year; savings in switching, per well, several times more. Fig. 5—(Right) Schematic diagram of the controller shown in Fig. 4. See text for explanation of operation

less per barrel of stock-tank crude recovered, and the gravity of oil sold to the pipe line has been increased approximately 2°.

Four Time-Cycle Controllers

Entire installation of the automatic arrangement on eight wells connected to a tank battery on a Permian basin property is shown in Figs. 1, 2, and 3. In Fig. 1, from front to rear, are the Hanlon-Waters motor valves and time-cycle controllers, the flow manifold, separator, and tank battery. Flow lines from the wells, before connecting to the risers to the motor valves, are brought to a central point at the surface and through a tee. The tee has a bull plug through which a paraffin scraper may be removed.

One of the eight wells is temporarily closed in, and no motor valve is present on the lead line from that well to the manifold. It will be noted that with this exception, each controller is connected to the diaphragms of two motor valves. In this manner each intermitter controller does double duty, as first one valve opens to allow a well to complete its flow cycle, then later the companion valve is opened for second well. The cycles cannot overlap.

Arrangement of piping to the motor valves, controllers, and manifold is pictured in Fig. 2. Gas to operate the valves is taken through a ½-in. line from connection on the separator gas outlet and passed through a small caustic soda treater and scrubber, as the gas is sour. In the photograph the treated gas supply is shown piped to the small regulators at each controller, where the pressure is regulated to a constant level of 15 to 20 psi.

In Fig. 3 one of the controller cases is open to show the timing disk. The disk rotates in clockwise direction, and has three concentric circles of cam holes. Timing screws placed in the middle row actuate a toggle arm valve, placing it in neutral position. In this position no pressure is transmitted to the diaphragm of either motor valve. A screw placed in any of the inner holes will operate the motor valve connected to the lower outlet from the case, by opening the conduit to the inlet supply. The valve will remain open until a screw placed in one of the middle row of holes returns the toggle arm to its middle or neutral position. Likewise, a screw placed in one of the outer holes of the timing disk will operate the second motor valve by opening the conduit to its diaphragm to the pressure supply, and the valve will remain open until a screw in the middle row of holes returns the yoke to neutral. In setting the timing schedule, of course, one valve cycle cannot be made to overlap the other.

Fig. 6—Earnings from this two-stage separator figure about $6,132 per year, plus providing high-pressure gas fuel, and greater volumes of stock-tank oil

Timing of the flow schedules of the wells is given in Table 1, together with choke sizes, allowables, rates of production. The production is definitely a "stop-cocked" operation, the individual flowing periods ranging from 2 hours 24 minutes to 3 hours 4 minutes. Actual producing rate for these short periods ranges from about 305 to 380 bbl. per day, except for the No. 8 well which is flowed at the rate of 620 bbl. per day. By test, these rates were found to yield minimum gas-oil ratios for the individual wells.

Controllers at Well Heads

At the pressure-maintenance project in the Maljamar pool of western Lea County, New Mexico, the operators have concluded that it is cheaper, as well as more desirable from reservoir standpoint, to devote attention and equipment to obtaining the lowest possible gas-oil ratios at the wells, rather than exercising less

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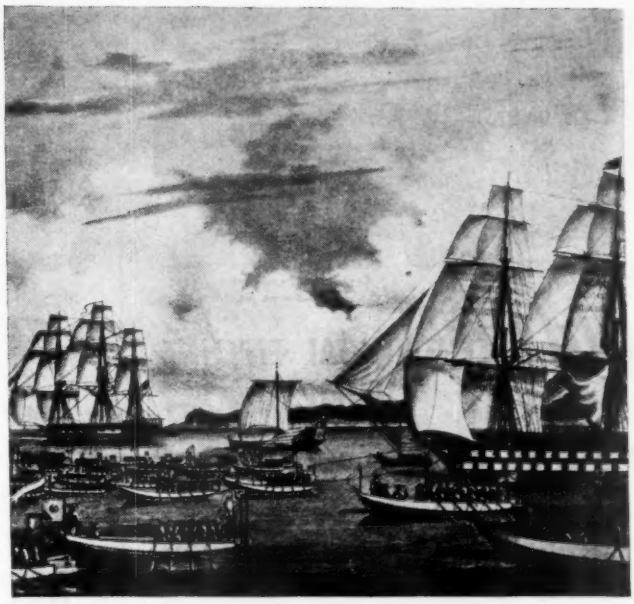

Famous Facts

In 1852 Commodore Matthew C. Perry was commissioned by President Fillmore to negotiate a treaty between the United States and Japan. The following year, having made all preparations for war, his fleet sailed into the bay at Yedo (now Tokyo). On March 8, 1854, a treaty of peace and amity was signed that gave American ships access to Japanese ports, provided for a United States consul in Japan, protection to visiting ships and crews, and opened trade between Japan and the western world.

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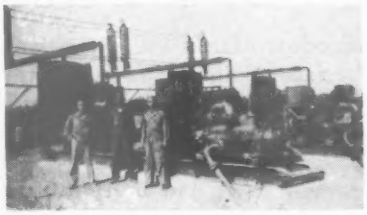

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Here is conclusive proof that when it's performance and dependability that count, Goulds can supply "*the* Pump for *the* job."

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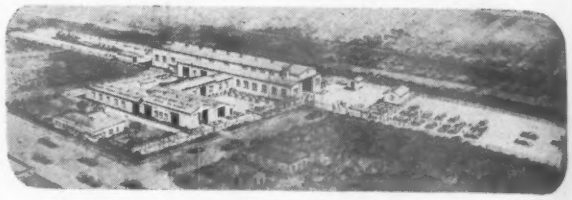

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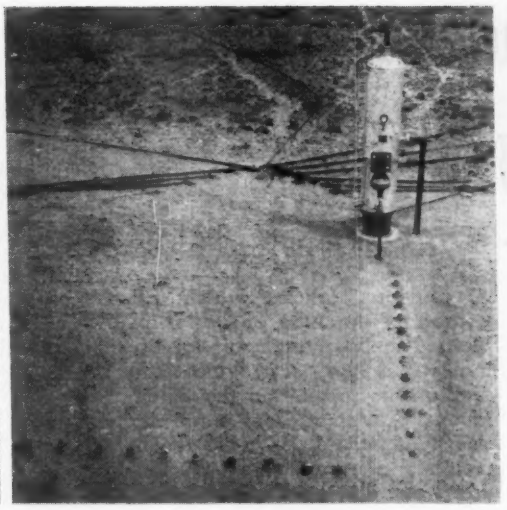

Fig. 7—(Left) Pilot-operated pressure regulator to fuel system. Fig. 9—(Right) High-pressure separator has pilot-regulated dump valve. The lead lines from wells terminate in paraffin traps at the surface, before connecting underground with the block valves shown in foreground

care to that point and simply recompressing the "excess" produced gas back to 1,600 psi. and returning it to the formation through the injection system. Part of the work along this line is done by manual switching and stop-cocking, but approximately 25 wells are equipped with Fisher time-cycle controllers and diaphragm valves at the well heads, as shown in Fig. 4 and controlled automatically. After a well has been tested with various choke settings for a sufficiently wide range of flow rates, the choke setting which obtains the lowest gas-oil ratio is made, and the opening and closing lugs set on the clock wheel for a time period which will give the daily allowed production.

Principle of operation of the intermitter and motor valve is illustrated in Fig. 5. Gas pressure for operating the valve is taken from the casinghead through ¼-in. copper tubing through filter (1) to auxiliary pressure regulator (2). This regulator delivers a constant pressure of about 20 psi. to inlet block (3) of the intermitter pilot. The restricted orifice (4) is smaller than orifice (5). When cam follower (7) is riding the outer rim of the clock wheel (8), the flapper disk (6) is held away from the orifice (4), allowing pressure to bleed from the upper diaphragm chamber faster than it can be replaced through the restricted orifice (4). As the pressure on the diaphragm decreases, the main valve (9) closes.

As the clock rotates the cam assembly, the follower (7) is raised by the closing lug (A) until it slips over the edge and rides the top of the wheel, permitting the spring to pull the flapper disk against the orifice. Pressure then builds up on the diaphragm and the main valve opens. This portion of the cycle continues until the follower lever again contacts the next opening lug (B on the top wheel) when it is forced to the outer rim of the wheel.

Clock used is 7-day wind, 24-hour rotation type, so very little time is required to handle the well once the flow testing and timing settings are made. If the gas-oil ratio is reduced 500, the saving made on an allowable of 40 bbl. per day, with gas recompression costs of 2 cents per 1,000 cu. ft., is 40 cents per day. This is a saving, or just as well, an equipment earning of $146 per year from this point alone. Savings from switching costs can be much more.

Two-Stage Separation Hookup

The installation of separators pictured in Fig. 7 cares for 12 wells, each of which has an allowable of approximately 35 bbl. per day. Increase in gravity of the crude sold to pipe line since the arrangement has been made has been 2°, sometimes more. Such increase brings 4 cents more revenue per barrel, and on a yearly basis is worth $6,132. Then, too, gas from the high-pressure trap is controlled by a pilot-operated back-pressure regulator (Fig. 7) to a pressure sufficient (about 400 psi.) to transmit desired

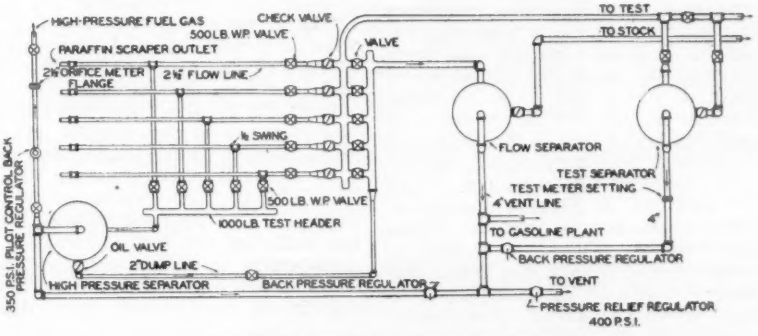

Fig. 8—Schematic drawing of the piping

volumes through a gas system for several miles to drilling rigs and other usages. Remainder of the gas from this source is spilled over to the gas line to a gasoline plant.

Schematical drawing of the piping, which besides effecting two-stage separation, allows any well to be tested individually, and permits the high-pressure separator to be bypassed if desired, is given in Fig. 8. View of the high-pressure separator, which is dumped by a pilot-controlled diaphragm valve, is shown in Fig. 9, together with the rows of plug valves that are used to block off a given well and give passage to the test separator, storage, and orifice-meter setting.

TABLE 1—TIMING OF FLOW SCHEDULES OF WELLS

Well No.	Size choke	Time open	Time close	Flowing interval	Gal. day allow.	Bbl. prod.	Bbl. per min.
1	17/64	10:15 a.m.	1:11 p.m.	2 hr. 56 min.	45	46.5	.264
2	16/64	1:43 p.m.	4:39 p.m.	2 hr. 56 min.	31	33.75	.192
3	16/64	5:11 p.m.	8:07 p.m.	2 hr. 56 min.	37	39.75	.226
4	Closed in						
5	16/64	8:39 p.m.	11:35 p.m.	2 hr. 56 min.	36	37.5	.213
6	16/64	12:15 a.m.	2:39 a.m.	2 hr. 24 min.	35	38	.264
7	16/64	3:19 a.m.	6:23 a.m.	3 hr. 4 min.	38	39	.212
8	20/64	7:03 a.m.	9:35 a.m.	2 hr. 32 min.	63	65	.428

Stability Index Judges Cooling Water

*by Joe R. Wright**

A previous article, which appeared in the June 23 issue, explained the derivation of stability index and the tests which are prerequisite to making the calculations. Advantages of simplicity and time saved by most recent methods of making the calculation were illustrated. Specific examples are now given where stability index predicts accurately the performance of cooling water and points to remedial treatment for scale and corrosion.

AN ordinary analysis may indicate a given water to be nonscale forming and yet it may form considerable scale in cooling systems. Application of the stability-index calculations allows accurate prediction of what may be expected, provided that a proper analysis is available and the service temperatures are known. Some data on a gasoline plant water supply are given in Tables 1 and 2.

It is thus shown that the water will be slightly corrosive at low temperatures and slightly scale forming at elevated temperatures. Inspection of buried water lines at the plant reveals that these pipes are corroded only very little on the inside. It is also known that some "teakettle" scale occurs in water heaters where the water temperature is about 180° F. A chart of stability index values, Fig. 1, shows this water to be neutral, i.e., neither scale forming nor corrosive, at pH 7.5 and 136° F. For the purpose of illustration, curves are also drawn for different pH values. It will be seen that if the water were adjusted to pH 7.0 it would be in the corrosive range at all temperatures up to 200° F. Similarly, the water at pH 8.0 would be in the scale-forming range at all temperatures above 76° F.

For general purposes, such as a plant supply, the Eola water is ideally suited as it comes from the water well. Under certain conditions of use, it might be necessary to adjust the pH value. For example, scale could be eliminated at 200° F. by lowering the pH to 7.0. Likewise, if it were desired to operate at 150° F., the neutral pH is found at 7.1 on scale A-B in Fig. 1.

It should be fully understood that interpretation of the stability index is qualitative rather than quantitative, unless all conditions are fully known and actual experience with the water and its conditions of use are sufficient to make interpretations exact. In other words, there is no direct mathematical relationship in the rate of scale formation in two waters, one having a stability index of 1.0 and the other having 2.0. Upon first consideration, the latter water would appear to have twice the scale-forming ability of the first, all physical conditions being equal. Conditions have been observed that cause the relationship to appear roughly similar to that of pH values. For example, a solution which has a pH of 5.0 is 10 times as acid as one of pH 6.0. Also, a solution of pH 9.0 is 10 times as alkaline as one of pH 8.0.

Fallacy of judging scale or corrosion rates directly by use of stability index alone may be shown by assuming two waters, both having stability index of +2.0. However, one water has 5 p.p.m. of calcium and the other has 75 p.p.m. of calcium. In this case, no appreciable scale would result from the first water but scale would result quite rapidly from the other.

Adjustment of pH to satisfactory working conditions involves many similar chemical considerations. If it is necessary to lower pH, this may be done by acid, carbon dioxide, acid phosphate, or other acidic salt. The pH may be raised by lime, soda ash, caustic, ammonia or other alkali. Treatment must be selected which is best suited to attendant conditions and to economics of the job. The treatment must be

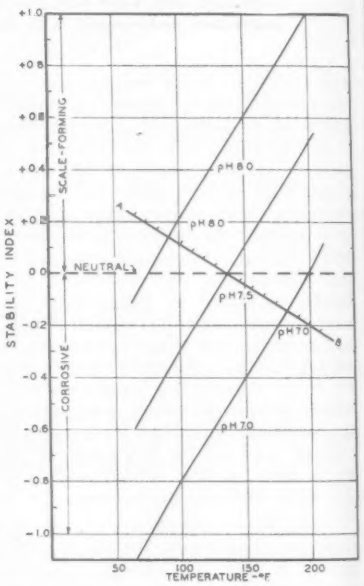

Fig. 1—Stability of water at Anchor Gasoline Corp. plant, Eola, La. Temperature vs. stability index

*Wright Petroleum Laboratories, Tulsa.

TABLE 1—WATER ANALYSIS, ANCHOR GASOLINE CORP. SUPPLY EOLA, LA.

Ca as $CaCO_3$	75.0 p.p.m.
Total alkalinity, as $CaCO_3$	76.0 p.p.m.
Total solids	94.0 p.p.m.
pH value (determined)	7.5

TABLE 2—EOLA STABILITY COMPUTATION

Temp. (°F.)	Determined pH	Calc. pH_s	Stability index (pH—pH_s)	Interpretation
65	7.5	8.1	—0.6	Corrosive
100	7.5	7.8	—0.3	Slightly corrosive
150	7.5	7.4	+0.1	Very slightly scale forming
200	7.5	7.0	+0.5	Slightly scale forming

TABLE 3—RAW WATER FROM WELL, CENTRALIA STATION

Ca, as $CaCO_3$	320 p.p.m.
Total alkalinity, as $CaCO_3$	375 p.p.m.
Total solids	430 p.p.m.
pH value (determined)	7.0

TABLE 4—COMPUTATION OF STABILITY INDEX, CENTRALIA RAW WATER

Temp. (°F.)	Determined pH	Calc. pH_s	Stability index (pH—pH_s)	Interpretation
100	7.0	6.6	+0.4	Slightly scale forming
150	7.0	6.2	+0.8	Scale forming

TABLE 5—COOLING WATER, AFTER 90 DAYS IN DIESEL COOLING SYSTEM, CENTRALIA

Ca, as $CaCO_3$	5 p.p.m.
Total alkalinity, as $CaCO_3$	505 p.p.m.
Total solids	650 p.p.m.
pH value (determined)	9.2

TABLE 6—CORRESPONDING STABILITY INDEX AFTER 90 DAYS, CENTRALIA

Temp. (°F.)	Calc. pH_s	Stability index (pH—pH_s)	Interpretation
100	8.3	+0.9	Scale forming
150	7.8	+1.4	Highly scale forming

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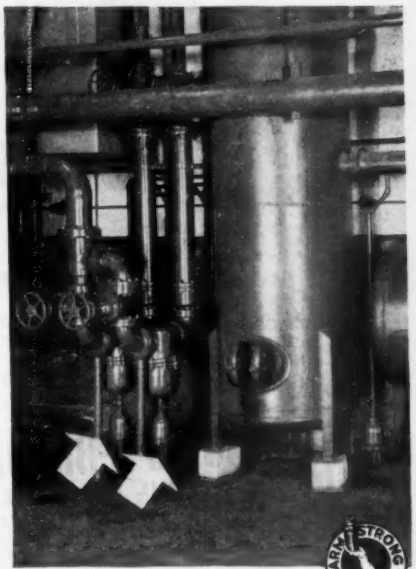

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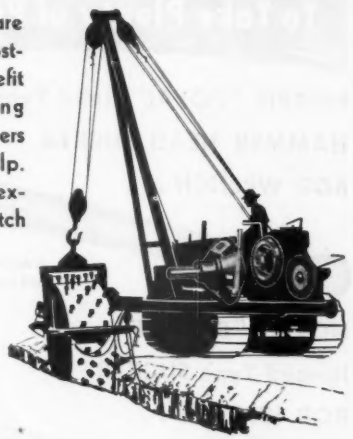

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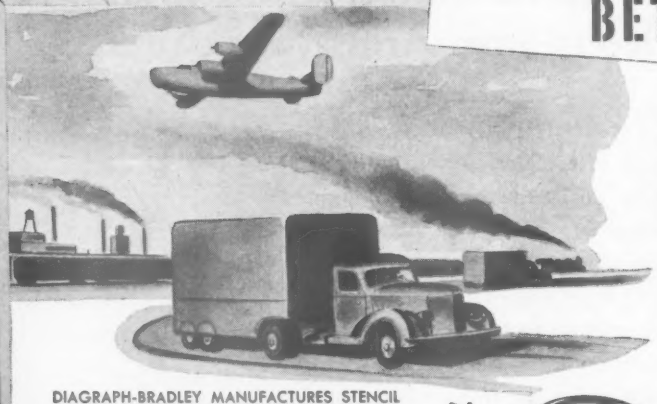

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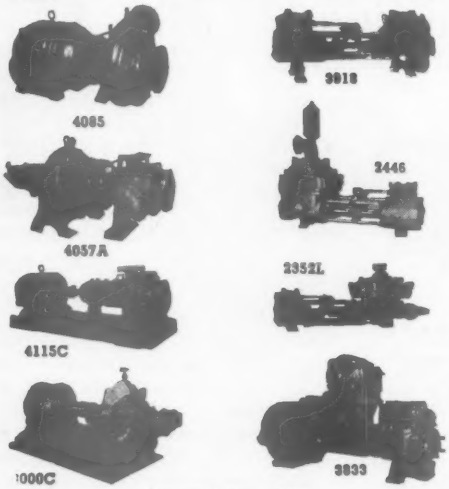

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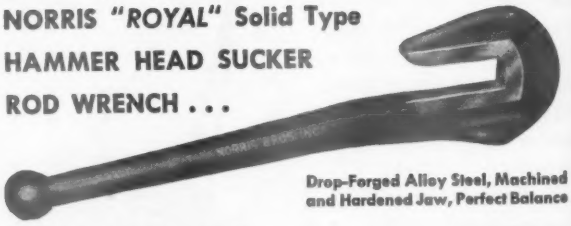

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TABLE 7—RAW WATER, OUT OF BAYOU, EOLA

Ca, as $CaCO_3$	22.5 p.p.m.
Total alkalinity, as $CaCO_3$	30.0 p.p.m.
Total solids	62.0 p.p.m.
pH value (determined)	6.75

TABLE 8—STABILITY INDEX, EOLA RAW WATER

Temp. (°F.)	Determined pH	Calc. pH_s	Stability index (pH—pH_s)	Interpretation
80	6.75	8.85	—2.10	Strongly corrosive
100	6.75	8.70	—1.95	Strongly corrosive
150	6.75	8.30	—1.60	Strongly corrosive
200	6.75	7.80	—1.05	Corrosive

TABLE 9—DEPHLEGMATOR WATER, EOLA

Ca, as $CaCO_3$	6.5 p.p.m.
Total alkalinity, as $CaCO_3$	10.0 p.p.m.
Total solids	28.0 p.p.m.
pH value (determined)	6.10

TABLE 10—STABILITY INDEX, DEPHLEGMATOR WATER, EOLA

Temp. (°F.)	Determined pH	Calc. pH_s	Stability index (pH—pH_s)	Interpretation
80	6.1	9.9	—3.8	Very strongly corrosive
100	6.1	9.7	—3.6	Very strongly corrosive
150	6.1	9.3	—3.2	Very strongly corrosive
200	6.1	8.9	—2.8	Very strongly corrosive

worked out and prescribed by a chemist because ideal treatment may sometimes be found only by a certain amount of laboratory experimentation even after all chemical calculations are made. This is true because chemical compounds in a water solution are always in equilibrium and alteration of any one of these disturbs the equilibrium which must then be recalculated. As an example, the pH at stability of a given water may be found at 7.5, while pH of the original water is 7.0. Adjustment to pH 7.5 with lime lowers calcium and total alkalinity so that the water is found to have a stability index of +0.5 rather than 0.0, or neutral. This and other similar factors must be taken into account by the chemist when calculating pH adjustment.

In addition to predicting beforehand the performance of a given water, stability index data may be applied to cooling water corrective treatment. The operating conditions must be observed and recorded. Thereafter, analysis and stability-index calculations will indicate necessary changes in the type and amount of chemical treatment being used. One operator, at a pipeline station near Centralia, Ill., reported a cracked cylinder head in a diesel engine where the average temperature of the water was 120° F. Analysis of the water is shown in Tables 3, 4, 5 and 6.

In this case it was noted that the pH value was quite high in the cooling water and almost all of the calcium had been precipitated out as scale. Since the raw water was shown to be only slightly scale forming at operating temperatures of 120° F., there seemed to be strong evidence of addition of alkaline chemical to the cooling system water. Investigation showed that the attendant had been adding sodium aluminate for the stated purpose of preventing scale in the engine-cooling system. The use of this alkaline compound accelerated the scale accumulation which was the direct cause of the cracked cylinder head. Without treatment of any kind, this water would have given practically no trouble in the diesel-cooling system, either from corrosion or scale formation.

Operating the cooling system at 120° F., with stability index at +1.4, gave rise to the scale in the section of pipe shown in Fig. 2. This figure illustrates a very interesting case of corrosion which was corrected by application of stability-index values. Anchor Gasoline Corp. at Eola was experiencing very severe corrosion in the return lines from the dephlegmator. Raw water from a nearby bayou was being used for makeup. Water analyses as presented in Tables 7, 8, 9 and 10, showed the relationships.

The analyses show that severe corrosion would occur in lines carrying this water at 80° F. to 200° F. Thus, the corrosion in the return lines from the dephlegmator was in accord with the water-analysis data. Since the average water temperature in the dephlegmator was approximately 200° F., it is seen that the pH would have to be raised to 8.9 in order to eliminate the corrosion. This could be done without danger to equipment since there were no brass or copper pipes in the system. The pH adjustment was accomplished effectively and economically by the use of soda ash and corrosion has given no further trouble since the corrective treatment.

A future article will deal with the control of flooding water and dilute waste brine for injection by application of the stability index. Illustrations of formation plugging will show the costly effects of injecting unstable water.

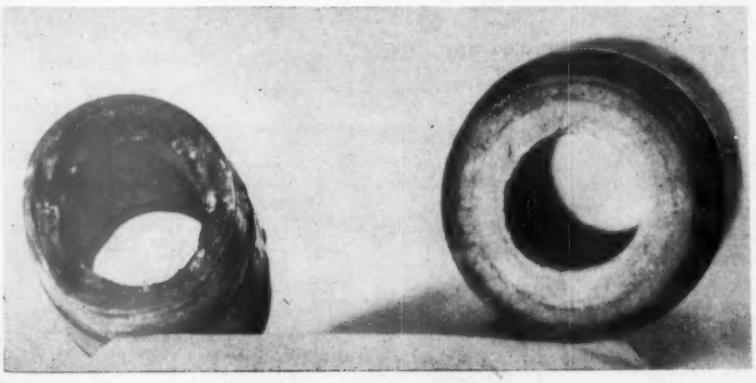

Fig. 2—The severe corrosion in the section of pipe at the right was corrected by application of stability-index values, as seen in the pipe section at left

Priorities System Will Be Simplified

DETAILS of a revised and simplified priorities system leading to ultimate discontinuance of priorities assistance for "virtually everything except military requirements" as soon as war-supporting and essential civilian production no longer needs general help, has been announced by J. A. Krug, chairman of the War Production Board.

Krug announced a 6 months' transition period from July 1 to December 31, 1945, to "give business an opportunity to adjust its operations to the new system," which will go into effect after January 1, 1946. He said transition to the revised and simplified priorities system was necessary because "the military services have substantially reduced their supply programs as a result of victory in Europe."

The new priorities system will be introduced gradually during the period from July 1 through December 31, 1945, which will be known as the "transition period." This period is designed to cushion the impact of the transition from a system under which nearly all production has been regulated to a new sys-

(Continued on page 121)

PROGRESS IN METALS

by W. L. Nelson
Consulting Engineer

Used Cement-Lined Pipe

ACCORDING to Information Circular IC 7314 by Peter Grandone of U. S. Bureau of Mines (Reclaiming Used Pipe for Oil-Field Operations with Cement Lining), "In many instances, cement-lined used pipe serves equally as well as cement-lined new pipe." The effectiveness of a cement lining is in most instances dependent upon the lime content of the cement (H. J. Carson, Cement-lined Water Mains, Ind. Eng. Chem. 19, 781, 1927) particularly for brines that are rich in magnesium sulfate and hydrogen sulfide. These materials cause high-lime cement linings to soften and crumble, and hence pozzuolana-type materials that are low in lime and rich in silica are used by most manufacturers instead of portland cement. Even with regular waters the lime content of the cement is important because E. L. Chappell (Chemical Characteristics of Cement Pipe Lining, Ind. Eng. Chem. 22, 1204, 1930) reports that lime had been replaced by iron hydroxide in the cement lining of pipe that had been in service for 50 years in the water system of Worchester, Mass.

The modern pipe developed for use in the oil industry has such a high strength and such thorough bonding of the cement to the pipe that no special precautions are required in the handling of it. It may be cut and threaded just as ordinary pipe. Pipe fittings are also available; these are produced by hand manufacturing methods rather than centrifugal process employed in lining the straight pipe.

With respect to **water flooding**, cement-lined pipe is being used for water-distribution lines, tubing in input wells, tubing in producing wells that are flowing, and oil-gathering lines. The use of cement lined tubing in wells that are on the pump is not practical because the rods tend to damage the lining. One operator electric-welds all joints in the surface lines.

In **brine disposal** systems either cement-lined or special corrosion-resistant materials (asbestos-cement or fiber-asphalt) may be used for surface pipe but steel tubing (cement lined) is used for disposal wells because of its greater strength.

In **oil production** cement-lined oil-gathering lines are useful if large amounts of brine and hydrogen sulfide are associated with the oil.

In 1944 the **costs** of lining pipe with cement at the plant were about as follows:

Pipe size, inches	Cost per ft., dollars
1.5	0.075
2.0	.085
3.0	.125
4.0	.17
6 to 7	.25

In addition, the cost of transportation to and from the plant may be important.

In the Mid-Continent oil-producing area six plants are available, at Tulsa, Oklahoma (2 plants), Nowata, Okla.; Iola, Kansas; Salem, Ill., and Gladewater, Texas. It is usually necessary to supply the pipe to the plant, but a few manufacturers offer pipe for sale.

Grades.—Used pipe is classified as follows:

No. 1—Free of pit holes, good threads, and rings clear when tapped with a peen hammer in the so-called "hammer test." This grade may be used for the same working pressures as new pipe.

No. 2—Some pits and a few holes not larger than ⅛-in. in diameter are permitted but the holes are spot welded before applying the lining. This grade does not ring clear by the hammer test and it is recommended that the pipe be "shopped" for new threads before the lining is applied.

No. 3—Not generally suitable for lining with cement. The dimensions and weights of cement-lined pipe are shown in Table 1.

TABLE 1—DIMENSIONS AND WEIGHTS OF CEMENT-LINED PIPE (FOR NEW PIPE)

Nominal size, inches	Internal diameter—Unlined, inches	Internal diameter—Cement-lined, inches	Thickness of lining, inch	Weight, per foot—Unlined, pounds	Weight, per foot—Cement-lined, pounds
0.50	0.622	0.484	0.06	0.85	0.97
.75	.824	.686	.06	1.13	1.29
1	1.049	.896	.06	1.67	1.91
1.25	1.380	1.175	.08	2.27	2.68
1.50	1.610	1.405	.08	2.71	3.20
2	2.067	1.780	.10	3.65	4.53
2.50	2.469	2.182	.10	5.79	6.85
3	3.068	2.725	.125	7.57	9.15
3.50	3.548	3.205	.125	9.10	10.95
4	4.026	3.620	.156	10.79	13.26
5	5.047	4.548	.187	14.61	18.43
6	6.065	5.440	.250	18.97	24.70
8	8.071	7.446	.250	24.69	32.41
8	7.981	7.356	.250	28.55	36.18
10	10.192	9.443	.312	31.20	42.91
10	10.136	9.387	.312	34.24	45.88
10	10.020	9.271	.312	40.48	51.99
12	12.090	11.341	.312	43.77	57.74
12	12.000	11.251	.312	49.56	63.43

Glass for Hydrofluoric Acid Alkylation Plants

A new glass has been developed by American Optical Co., Southbridge, Mass., that is highly resistant to attack by hydrofluoric acid. Of the type known as phosphate glasses, the new material possesses other important properties that will make it a useful material of construction, especially in certain branches of the chemical field.

Although glass has become an important material of construction in the chemical industry, and the description "resistant to all acids except hydrofluoric acid" has become a standard phrase, it was the chemical field particularly that asked for the new glass.

Leaders in fluorine chemistry recognized the importance of being able to see what was going on in reaction vessels, and fluorine catalysts have become increasingly important in many processes. Aviation gasoline and synthetic rubber required fluorine compounds, while metallic fluorides have found new and expanding uses. The new glass stays transparent even if attacked.

The new phosphate glass developed by Dr. Alexis G. Pincus can be melted at about 2,500° F., is easily blown or drawn from about 2,000° F., and anneals at about 1,100° F. Quality and color are good. Thermal expansion coefficient, about 5×10^{-6}, is rather high, but the glass is tough and resists considerable thermal shock.

The material can be blown, drawn, cast, ground, and polished without any drastic modification of present processes.

Abstracted from Glass Ind. Vol. 25, Dec. 1944, p. 548 in the April 1945 issue of Metals & Alloys.

Metallurgical Terms

Blooming Mill and Cogging

Ingots are reduced in size to blooms by an operation of rolling and forging which is called cogging.

A blooming mill is used to reduce blooms to smaller steel shapes such as billets, slabs, etc.

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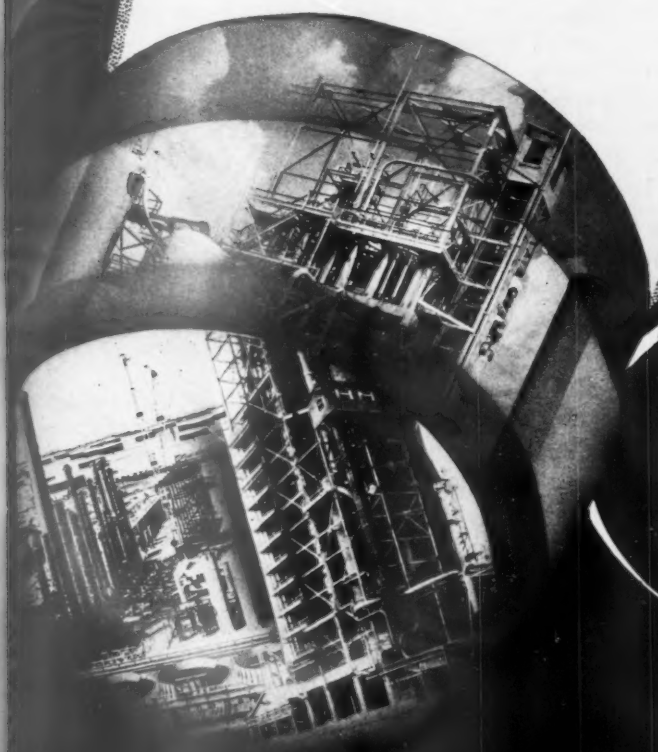

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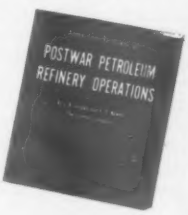

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Physical Properties Of Light Hydrocarbons

By M. L. SMITH and G. H. HANSON

THE accompanying table of physical properties of light hydrocarbons is concerned only with the light hydrocarbons. A more detailed presentation of their physical properties is made than is given in other compilations (67, 68, 69 and 70). In addition, an attempt has been made to incorporate the most recent values of these physical properties. When several published values for a single physical property were available, the National Bureau of Standards reports in connection with A.P.I. Project 44 were used as a guide in selecting the value for this table. In connection with the physical properties involving gaseous volumes both ideal and actual values are given. The ideal values are those which would be obtained if the hydrocarbon vapors were ideal gases, and the actual values include the deviation of hydrocarbon vapors from ideal gases.

PHYSICAL PROPERTIES OF LIGHT HYDROCARBONS. ALL VALUES REFER TO 60° F. AND 14.696 PSIA. UNLESS OTHERWISE SPECIFIED

Hydrocarbon	Formula	Molecular Weight	Wt. % Carbon	Wt. % Hydrogen	Critical Constants: Temperature, F	Critical Constants: Pressure, psia	Melting Point, F	Boiling Point, F	Specific Heat (BTU/lb/F): Gas c_p	Gas c_v	Gas c_p/c_v (g)	Liquid $c_{p_{60}}$	Liquid Other Temperatures c_{p_t}	Liquid Other Temperatures t F	Latent Heat of Vaporization at (BTU/lb): Boiling Point	Latent Heat of Vaporization at (BTU/lb): 60 F	Coefficient of Expansion (1/v)(dv/dt) (Liquid): 0 F	60 F	120 F	Vapor Pressure, psia (b): 0 F	70 F	90 F (a)	100 F	105 F	130 F
Methane	CH_4	16.04	74.88	25.12	-115.8 (40)	673.0 (40)	-296.5 (7)	-258.4 (40)	0.526 (60)	0.400	1.315	-	0.818 (7)	-276	220.8 (40)	-	-	-	-	-	-	-	-	-	-
Ethylene	C_2H_4	28.05	85.63	14.37	49.5 (52)	748 (52)	-272.5 (16)	-154.9 (17)	.363 (62)	.296	1.22	-	-	-	207.6 (16)	-	0.0050*(21) 0.0049*(22)	-	-	385 (44)	-	-	-	-	-
Ethane	C_2H_6	30.07	79.88	20.12	90.1 (4)	708.3 (4)	-297.8 (8)	-128.2 (8)	.409 (60)	.347	1.18	0.78 (20)	.569 (8)	-150	210.5 (8)	100 *(66)	.0021*(6)	0.0045 (6)	-	206 (28)	563 (6)	710	-	-	-
Propylene	C_3H_6	42.08	85.63	14.37	196.5 (14)	667.2 (14)	-301.4 (18)	- 53.8 (17)	.363 (10)	.316	1.15	.57*	.519	(18) -57.6	188.2 (18)	149 *(14)	.0013 (56)	.0017 (56)	0.0027 (59)	47.9 (14)	151.4 (14)	197.7	225.6	239.3	323.2
Propane	C_3H_8	44.09	81.72	18.28	206.2 (5)	617.4 (5)	-305.8 (9)	- 43.7 (9)	.388 (60)	.343	1.13	.58*(2)	.69	(2) 125	183.3 (9)	152.6 (33)	.0012 (56)	.0016 (56)	.0025 (58)	37.8 (33)	124.3 (33)	165.0	188.7	201.4	274.5
Butadiene-1,3	C_4H_6	54.09	88.82	11.18	305.6 (29)	628 (29)	-164.0 (49)	24.1 (49)	.349 (50)	.312	1.12	.53 (49)	.510	(49) 20.0	178.7 (49)	170.2 (49)	.0010 (55)	.0011 (55)	.0013 (55)	8.5 (49)	36.0 (49)	50.6	59.3	64.1	92.4
Butene-1	C_4H_8	56.10	85.63	14.37	291 (53)	576 *(29)	-301.6 (19)	20.7 (19)	.371 (11)	.334	1.11	.53*(19)	.507	(19) 5.8	168.0 (19)	157.2 (19)	.0010 (57)	.0011 (57)	.0014*(57)	9.2 (17)	38.3 (17)	53.5	62.6	67.5	96.6
cis-Butene-2	C_4H_8	56.10	85.63	14.37	320 * (29)	610 *(29)	-218.0 (37)	38.7 (37)	.350 (26)	.315	1.11	.53*(22)	.497	(22) 0.0	178.9 (37)	173.8 (37)	.0009 (57)	.0010 (57)	.0013*(57)	6.0 (37)	27.3 (37)	38.9	46.0	49.8	73.2
trans-Butene-2	C_4H_8	56.10	85.63	14.37	311 (53)	595 *(29)	-158.0 (54)	33.7 (54)	.376 (26)	.342	1.10	.54*(54)	.510	(54) -2.8	174.4 (54)	167 *(66)	.0009 (57)	.0011 (57)	.0012*(57)	6.8 (17)	29.4 (17)	41.1	47.9	51.6	73.1
Isobutylene	C_4H_8	56.10	85.63	14.37	292.5 (15)	580.2 (15)	-221.3 (22)	19.2 (17)	.375 (50)	.335	1.12	.55*(22)	.517	(22) -4	168.7 (23)	156 *(66)	.0010 (57)	.0011 (57)	.0014*(57)	9.6 (17)	37.8 (17)	51.5	59.4	63.7	87.5
Isobutane	C_4H_{10}	58.12	82.66	17.34	272.7 (65)	537.0 (65)	-255.0 (47)	10.9 (47)	.387*(60,61)	.348	1.11	.56 (1)	.534	(47) 8.3	157.5 (47)	143 *(66)	.0010 (56)	.0012 (56)	.0015 (56)	11.5 (47)	45.0 (47)	61.7	71.8	77.5	109.5
n-Butane	C_4H_{10}	58.12	82.66	17.34	306.0 (35)	550.1 (35)	-216.9 (48)	31.1 (48)	.397 (60)	.361	1.10	.55 (2)	.538	(48) 12.	165.6 (48)	162 *(66) (66)	.0009 (56)	.0011 (56)	.0013 (56)	7.3 (48)	31.3 (48)	44.0	51.6	55.9	80.8

Hydrocarbon	Limits of Inflammability in Air (13): Lower Limit, %	Higher Limit, %	Maximum Rate of Flame Propagation (1" tube) **(30): In. / sec	Per cent gas	Maximum Flame Temperature in Air (30): Observed Temperature, F	Calculated Temperature, F	Per cent gas	Flash Temperature, F (Calculated) (d)	Ignition Temperature, F (32)	Required for Complete Combustion (Ideal Gas): cu ft O2/cu ft gas	cu ft air/cu ft gas	lb O2/lb gas	lb air/lb gas	Products of Combustion (Ideal Gas): cu ft CO2/cu ft gas	cu ft H2O/cu ft gas	lb CO2/lb gas	lb H2O/lb gas	Specific Gravity Ideal gas=1	Specific Gravity Actual gas=1	Molecular Volume, cu ft/lb mol (e): Ideal	Actual	Density, lb/cu ft gas: Ideal	Actual	Liquid Specific Gravity 60/60 F (at saturation pressure): Liquid	Liquid lb/gal of liquid	Total Heating Values (After Vaporization): BTU/cu ft gas	BTU/lb gas	BTU/gal liquid
Methane	5.00	15.00	26	9.7-10.0	3416	3484	9.45-10.10	-306 (40)	1202	2.0	9.6	3.99	17.3	1.0	2.0	7.6	2.74	2.25	13.3	0.554	0.555 (25)	23.657	23.609	378.7	0.04227	0.04236	-	-	0.2476*(1)	-	1012	23,885 (63)	-
Ethylene	2.75	28.60	65	7.3-7.7	3587	3762	6.65-7.00	-213 (17)	905	3.0	14.4	3.42	14.8	2.0	2.0	11.4	3.14	1.28	11.3	0.968	0.977 (27)	13.528	13.412	376.2	.07392	.07456	-	-	-	-	1613	21,639 (64)	-
Ethane	3.22	12.45	34	6.3-6.6	3443	3540	5.70-5.95	-211 (51)	986	3.5	16.7	3.72	16.1	2.0	3.0	13.2	2.93	1.80	12.3	1.038	1.048 (41,45)	12.621	12.498	375.8	.07923	.08002	39.69	39.31	.3772 (6)	3.145	1786	22,323 (38)	70,210
Propylene	2.00	11.10	39	5.0-5.4	3515	3722	4.45-4.90	-162 (17)	986	4.5	21.5	3.42	14.8	3.0	3.0	17.0	3.14	1.28	11.3	1.453*	1.476 (27)	9.019	8.876	373.5	.1109	.1127	39.25	38.63	.5220 (56)	4.352	2371	21,042 (64)	91,580
Propane	2.37	9.50	32	4.6-4.8	3497	3573	4.05-4.30	-156 (33)	932	5.0	23.9	3.63	15.7	3.0	4.0	18.9	2.99	1.63	12.0	1.522	1.550 (39,31)	8.607	8.453	372.7	.1162	.1183	36.45	35.80	.5079 (56)	4.235	2563	21,663 (38)	91,740
Butadiene-1,3	-	-	-	-	-	-	-	-	-	5.5	26.3	3.25	14.1	4.0	3.0	20.8	3.25	1.00	10.8	1.867	1.922 (49)	7.016	6.815	368.6	.1425	.1467	36.70	35.65	.6274 (55)	5.231	2968	20,230 (43)	105,820
Butene-1	)	)	)	)	)	)	)	)-112 (17)	)	6.0	28.7	3.42	14.8	4.0	4.0	22.7	3.14	1.28	11.3	1.937	1.998 (27)	6.764	6.558	367.9	.1478	.1525	33.91	32.87	.6012 (23)	5.013	3178	20,843 (64)	104,480
cis-Butene-2	)1.70	)9.00	)38	)3.9-4.1	)3806	)3691	)3.35-3.45	)	)950	6.0	28.7	3.42	14.8	4.0	4.0	22.7	3.14	1.28	11.3	1.937	2.004 (27)	6.764	6.536	366.7	.1478	.1530	35.37	34.18	.6272 (23)	5.229	3181	20,791[f](3)	108,730
trans-Butene-2	)	)	)	)	)	)	)	)	)	6.0	28.7	3.42	14.8	4.0	4.0	22.7	3.14	1.28	11.3	1.937	2.004 (27)	6.764	6.537	366.7	.1478	.1530	34.40	33.25	.6100 (23)	5.086	3176	20,759[f](3)	105,580
Isobutylene	-	-	-	-	-	-	-	-	-	6.0	28.7	3.42	14.8	4.0	4.0	22.7	3.14	1.28	11.3	1.937	1.998 (27)	6.764	6.557	367.9	.1478	.1525	33.85	32.81	.6002 (23)	5.004	3162	20,732[f](3)	103,750
Isobutane	1.80	8.44	)	)	3452	3583	3.15-3.25	-117 (47)	950	6.5	31.1	3.58	15.5	4.0	5.0	24.6	3.03	1.55	11.8	2.006	2.077 (39)	6.530	6.309	366.7	.1531	.1585	30.65	29.62	.5630 (56)	4.694	3369	21,258 (36)	99,790
n-Butane	1.86	8.41	)33	)3.6-3.8	3443	3583	3.15-3.40	-101 (48)	896	6.5	31.1	3.58	15.5	4.0	5.0	24.6	3.03	1.55	11.8	2.006	2.084*(39)	6.530	6.286	365.4	.1531	.1591	31.82	30.63	.5844 (56)	4.873	3390	21,308 (38)	103,830

(a) References for vapor pressures at 70 F are also the bases for vapor pressures at higher temperatures.

(b) The vapor pressure equations for C_4H_8-1, trans-C_4H_8-2 and i-C_4H_8 are not specifically applicable for temperatures of 70 F and above, cis-C_4H_8-2 90 F and above, but were used to estimate the values.

(c) 0.05 weight fraction of CH_4 in n-C_4H_{10} at 70 F and bubble point pressure of 460.5 psia.

(d) Flash temperatures were calculated using vapor pressure values from indicated references and lower limits of inflammability (13).

(e) Specific volumes at other conditions of temperature and pressure can be calculated from data presented in the references listed under "Specific Gravity of gas"

(f) Heats of combustion (or heating values) were calculated from heats of formation presented in reference 3.

(g) The ratio, c_p/c_v, for CH_4 was obtained from reference 12; all other values were estimated based on a correlation given in reference 42 and the ideal relationship for gases, $C_p - C_v = R$, where C_p and C_v are molal heat capacities.

Note: 1. An * indicates an estimated value.
2. A ** indicates that compilations have been used.
3. If no reference is given, values have been calculated from others given in this table.

Units:
1 standard atmosphere = 760 mm Hg.
1 standard atmosphere = 14.696 psia.
ice point: 273.16 K, 491.69 R.
1 (thermochemical) cal = 4.1833 int. joules (NBS)
1 (thermochemical) cal/g = 1.79882 (I.T. steam) BTU/lb
R = 0.08205 liter atm/deg g mol
1 cu ft = 28.3623 liters
1 lb = 453.5924 g
ideal gas volume at 60 F, 14.696 psia = 379.50 cu ft/lb mol
1 g/cc = 62.4283 lb/cu ft
1 cu ft H2O at 60 F = 62.37 lb
molecular weight of air = 28.966

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Diogenes didn't need a lantern

Diogenes, they say, was a very smart fellow. But when he took his lantern and went around looking for an honest man, he pulled an historic boner. Too bad that he didn't see his oculist twice a year. Diogenes needed glasses.

Had his vision been clear and true, he would have stepped up to the first person he met on the main street of ancient Athens — or any other place, for that matter — and ended his search. For almost everyone you come across is honest. Our experience proves that.

Only the other day a man, who had owed us $927 so long we had written it off the books, sent in the money — and a letter of explanation. He had been short, he said, quite a while. In fact, this was the first time he had had the money. So enclosed find check!

In many variations, our experience has convinced us honesty is more than the best policy—it is the almost universal policy. Most people feel Sancho Panza hit the nail on the head when he said, "Honesty is the best policy." The best known of copybook proverbs is a generally adopted rule of life. On the other hand, there's another old saw that's equally true. It says that to be good, to be honest, is no way to get your name in the papers. That doesn't seem right. Hence these few words on the subject.

You read about the bad. But nobody mentions all the good people. You never hear, for instance, about such citizens as an unusual customer of ours who always pays us with a signed blank check. We don't encourage this practice, but feel complimented just the same. Our patron and Sancho are a lot nearer the beam than Diogenes.

STANDARD OF CALIFORNIA

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awarded to our Richmond Refinery

MARY L. SMITH

G. H. HANSON

These determinations of physical properties of light hydrocarbons are the result of investigations by Mary Lavinia Smith and George H. Hanson, both affiliated with the Engineering Division, Research Department, Phillips Petroleum Co. in Bartlesville. Miss Smith was employed as a laboratory statistician by Eastman Kodak Co. in Rochester, following her graduation from Drury College in Springfield, Mo., and prior to joining Phillips. Hanson became affiliated with the engineering division just after receiving his Ph.D. degree in chemical engineering at University of Michigan in 1942. The greater part of his work to date has been in connection with investigations concerning catalysis in butadiene manufacture.

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Note: *Indicates that compilations have been used.

Priorities System Will Be Simplified

(Continued from page 115)

tem under which military requirements will have top priority but civilian business will generally operate both without production restrictions and without affirmative priorities assistance.

Meanwhile the procedures outlined in the new "Priorities Regulation 29" will be instituted gradually during the latter half of 1945. There will also be changes in other WPB regulations and orders, and the board cautioned that if there should be any inconsistency between PR 29 and any other WPB regulation or order, PR 29 controls "unless the other expressly states the contrary."

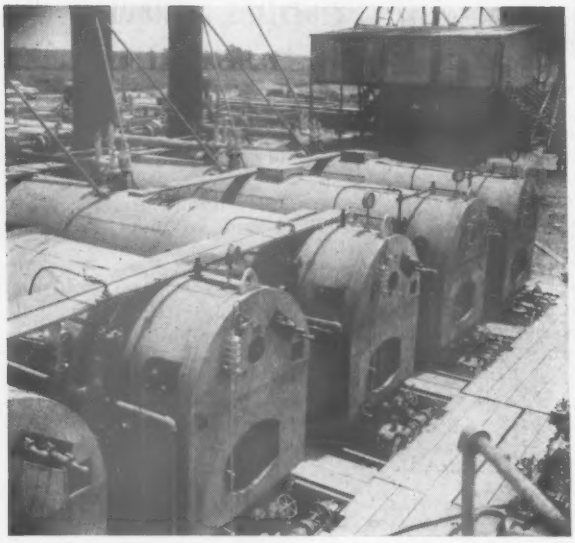
Under the new priorities rating system the present AA rating method and the Controlled Materials Plan will be discontinued at the end of 1945 and replaced by a system in which the AAA rating will still be assigned in emergencies as under existing procedures but a new MM rating will be assigned by military agencies. WPB itself will assign the MM rating only in cases where it is clearly necessary for the war effort or for requirements of similar urgency.

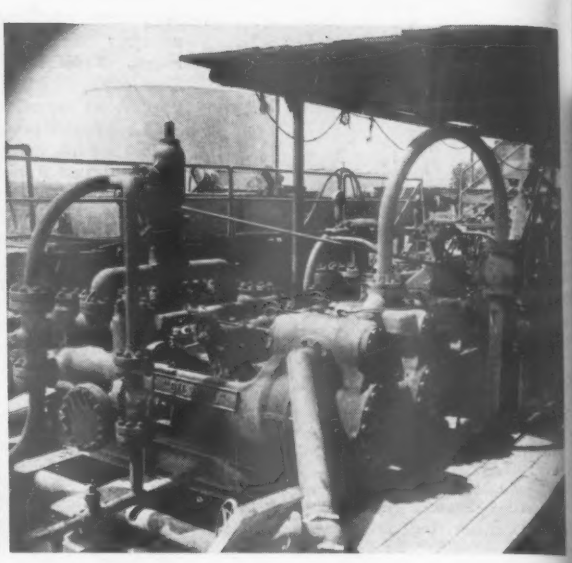
During the transition period from July 1 to December 31, the MM rating will be equivalent to AA-1. The AA ratings also will be retained for certain materials, such as textiles, if it is not practicable to adapt existing controls to the new system.

Beginning October 1, 1945, no more AA ratings will be assigned by WPB or other agencies except for deliveries to be made before January 1, 1946. Prior to October 1, 1945, WPB will cancel outstanding AA ratings calling for delivery after the end of 1945, whenever this can be done without interfering with war production or war-supporting activities. Further details on this phase of the transition will be announced later.

Beginning as soon as possible after July 1, 1945, the military services will assign the MM rating to orders and contracts placed during the transition period for deliveries during or after the transition period. They also may change existing orders with AA ratings to MM ratings if necessary to assure delivery on schedule.

At the end of the transition period, December 31, 1945, the Controlled Materials Plan and all its regulations will expire automatically, except that part of it which restricts inventories. However, the delivery of controlled materials during the third and fourth quarters of 1945 will continue to be regulated by the plan alone and not by ratings.





Left: Battery of five 150-hp., 350-psi. working-pressure boilers (one boiler barely visible) on deep drilling steam rig. Boilers are insulated and equipped with all modern automatic controls and safety devices. Right: Mud pump installation on same rig with one triplex pump (left) and two 20-in. duplex pumps

MODERN *Rotary Drilling Machinery* AND PRACTICES

Part 2—The Hoisting System

by W. S. Crake

This is the second of a seven-part discussion of modern rotary drilling equipment by W. S. Crake, assistant chief mechanical engineer, Shell Oil Co., Inc., Houston. The first installment was published in the July 7 Journal.

THE steam rig is almost invariably powered by locomotive-type boilers. These have been gradually developed until we now have the modern all-welded, 150-hp. 350-psi. proven types which are reliable and satisfactory. Experiments with 500-lb. working pressure locomotive boilers, marine-type boilers and other water-tube boilers have either been made or are contemplated. Locomotive boilers of 350 lb. working pressure and higher are inherently stiffer in construction than the old lower pressure boilers and have demonstrated that, unless adequate boiler plant is available to keep steam up to full pressure, high maintenance costs or staybolts and firebox troubles must be expected. Higher pressure boilers will even prove more troublesome in this respect. Little justification is available at this time to pay for approximately 100 per cent increase in cost of special boilers or 500 lb. working pressure locomotive boilers. Most commonly used industrial boilers are not adapted to ordinary oil-field use because they lack portability or require closely treated water for satisfactory service.

Modern deep-drilling rigs require at least four 150-hp. boilers, if firing on gas fuel, or at least five boilers when using oil fuel, for satisfactory steaming without excessive overload and maintenance costs. It is becoming increasingly evident that the operating economy of a five-boiler plant will fully pay for the extra boilers in time by reduced loading and better combustion. A modern 20-in. stroke slush pump consumes steam at a rate of approximately 45,000 lb. per hour, when fully loaded, and the rotary table and boiler auxiliaries consume approximately 15,000 lb. per hour under heavy loading. This totals 60,000 lb. per hour or nearly 1,750 boiler horsepower. With four boilers, this is 230 per cent of rating, which is hard to achieve, especially when one boiler is down for repairs or washing, when the rating goes up to 385 per cent and is practically impossible to achieve. On five boilers, the loading is about 233 per cent, which gives room for emergency power requirements such as mud gunning, jetting, etc., and for washing boilers without impairing drilling operations. Incidentally, the largest drilling engines cannot exceed about 48,000 lb. of steam per hour consumption, wide open, so that hoisting peaks are not the main problem in

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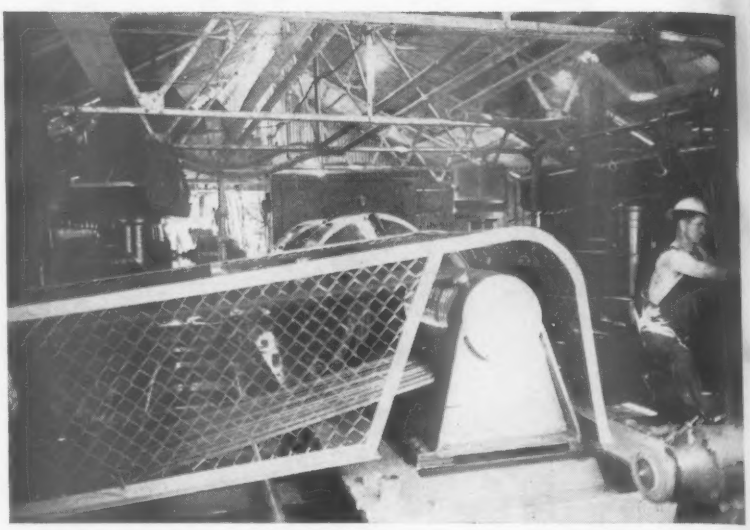
rig steam-generating capacity. The tremendous changes in heat transfer rates and steam demand during hoisting, however, are the main cause of firebox, staybolt, and tube troubles. Providing more boiler, or reserve steam capacity, and thus more even firing, is a great contributor to trouble-free boiler service. A trial is contemplated shortly of a heat accumulator as a means of absorbing these rapid changes.

Boiler load and steam-saving auxiliaries required on every rig are a good feedwater heater, good burners, and firing controls. Boiler insulation is very desirable where fuel is purchased. Boiler insulation can save about 10 per cent of the heat or, what is more important, will cause this volume of additional steam to be delivered to the rig with the same fuel consumption.

Whenever bad scale-forming water is used, some form of treatment is essential for good boiler service. A reputable water-treating service should be consulted in such cases. There is no known "gadget" or "miracle fluid" which will treat all boiler waters.

Direct application of steam power to the hoist is through a conventional reciprocating steam engine which is probably the most trouble-free part of the drilling rig. To insure this, and to obtain the maximum power, ample-sized steam lines, at least a 6-in. line, or its equivalent, should be used, and an adequate steam trap must be installed as close to the drilling engine as possible. With 350-lb. steam, having a temperature of 435° F., only the best of lubricating oil should be used. Lubricators should preferably be in duplicate so as to insure lubrication in case of one pump failing.

All modern hoists employ forced feed, or flood, lubricated precision drives which are more than justified by the reduction in maintenance cost which results therefrom.



Power plant of modern heavy-duty diesel-electric drilling rig. Generators (center) supplying indirect current to hoisting, pump and rotary drive motors are powered by two diesel engines, one on each side

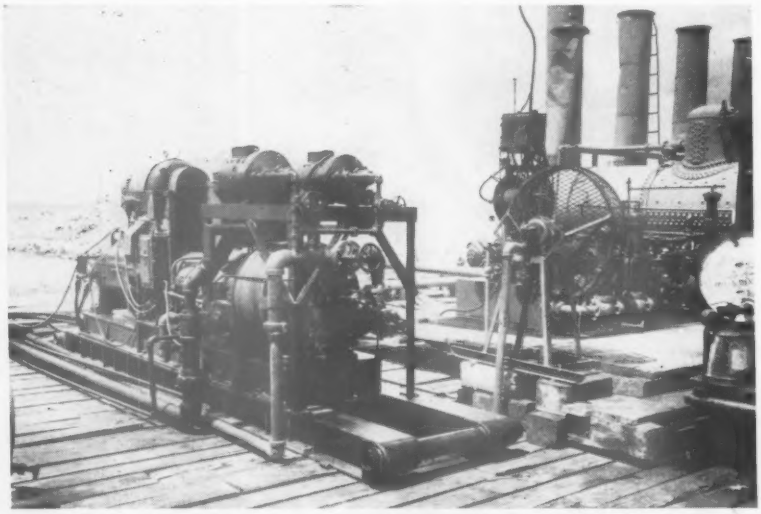
Direct Mechanical Drive

Modern mechanical rigs have progressed far from the original steam draw works—reverse clutch applications and the best types available today make use of friction drives on drum and master clutches. The trend seems to be towards all-friction drive with constant-mesh gears or chain.

Six-speed mechanical drive hoists have been a general standard as compared with four speeds on steam hoists. The increase to six speeds is necessary because of the inherent fact that internal-combustion engines drop only to about half normal speed to achieve maximum torque, while a steam engine or electric motor develops full torque when stalled.

The standard mechanical hoist of today uses an extra shaft or transmission behind the usual jackshaft, or power input shaft of a steam hoist. This input shaft, or transmission, incorporates a reverse gear for the infrequent but very necessary occasions when the reverse is required.

On modern medium-to-large power rigs, one of the chief disadvantages is the fact that the inclusion of the extra shaft or transmission makes it necessary to break the hoist into two pieces for transportation, and expose varying portions of the precision drives to sand, dust, and dirt while moving.



Steam turbine driven direct-current generator unit supplying power for independent rotary drive motor on deep drilling rig

Indirect Drives

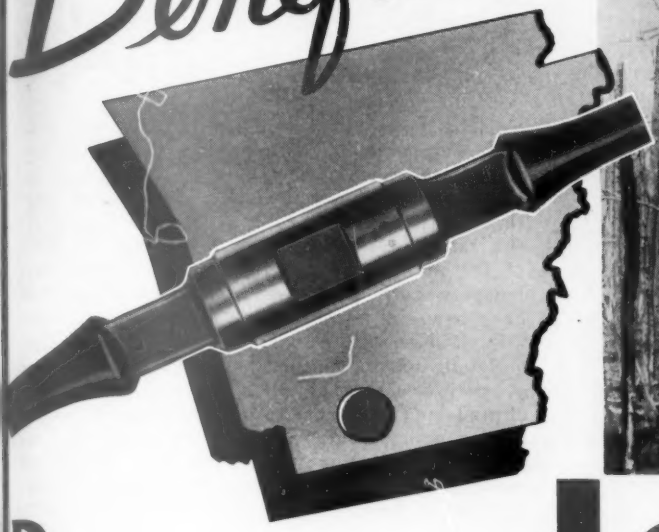
Electric drive uses the engines to generate electricity and drives the machinery by separately controlled motors. The best type of electric control, from a performance standpoint, is the Ward-Leonard DC type. A combination in which the pumps are belt driven and the hoist is electrically driven has been used although such a combination badly upsets the flexibility of the rig and gains little in efficiency.

Since the electric motor almost duplicates, or even improves on, steam engine torque characteristics, a steam hoist can be used with an electric rig.

The ease of rig-up, trouble-free performance, and flexibility of those few modern electric rigs which have been sufficiently powered for the job, have made firm friends, in spite of their being considerably higher in initial cost than direct mechanical

ARKANSAS

Benefits



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Always a pioneer, Jones has been consistently "First" with the Best in sucker rod design and manufacture.

A "STRING" of Jones Sucker Rod "FIRSTS"

- First to make an all-metal and double pin box sucker rod.
- First to end normalize and to fully normalize a sucker rod.
- First to use carbon manganese steel for sucker rods.
- First to use metal pin and box thread protectors and automatic machines for threading sucker rods.
- First to introduce a low metalloid rod to relieve corrosion and load problems.
- First to establish a Field Engineering Department.
- First to remove mill and forging scale by shot blasting.
- First to nickel plate sucker rods.

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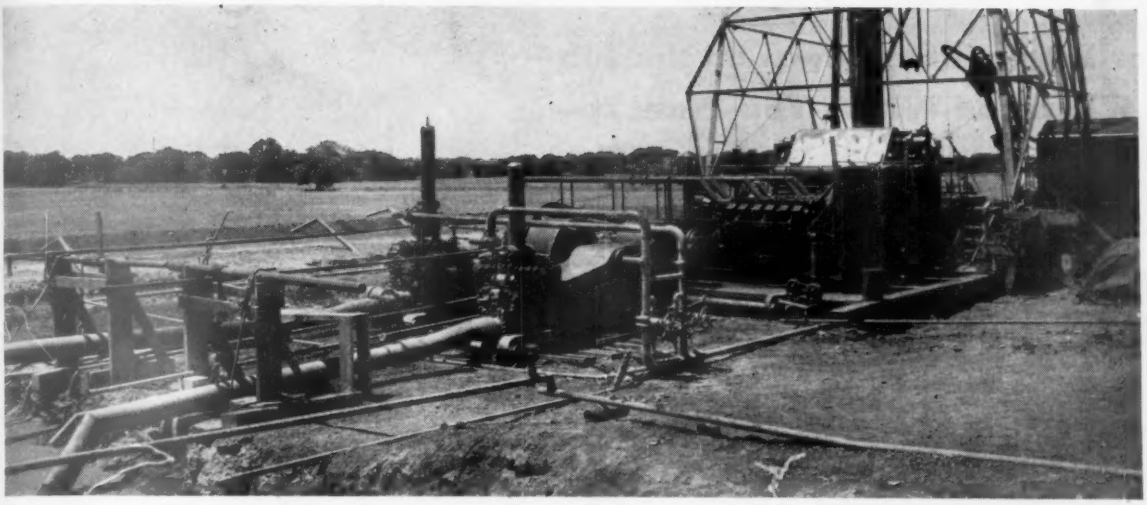

Modern heavy-duty direct-drive mechanical power rig employing three 350-hp. gas engines driving draw works and rotary table and two 20-in. power pumps through compounding unit

rig. Due to the shock-absorbing fluidity of electric drive, more horsepower can be safely and economically taken out of a given engine than on direct drives. While the writer has seen no actual field efficiency comparison tests between mechanical rigs and electric rigs, he is of the opinion that there is a negligible difference in power losses at full load.

Hydraulic-rig applications are still in their infancy and a considerable amount of new equipment of this type should be available after the war. The writer would be cautious in accepting hydraulic applications. The choice of operating ranges, speed ratios, etc., is very critical and, on drilling hoists, the types of loading applied are so varied as to complicate hydraulic applications to cover drilling, hoisting and, particularly, fishing. When properly applied, however, the hydraulic drive can be equally as flexible as electric drive.

Turbine-Electric Drives

Consideration has been given to steam turbine-electric drives and this is actually in use on rotary-table drive by one major operator. (See October 7, 1944, Journal, Page 63 Ed.) Whether turbine-condenser equipment can be made to stand the punishing hoisting load cycle simply and at reasonable cost is a question which remains to be answered. Such service is extremely severe on high-speed turbine governors and the wide and continuous variations in turbine blade temperatures are also a problem. Unless condensers are used with turbines, they will probably not be economical.

Over-all speed ratios on steam hoists generally give about 8 to 1 ratio from low to highest gear. Each step is about 2 to 1 and four speeds are almost universal. Some three-speed hoists are still manufactured but are not as flexible for over-all rig performance as four-speed hoists, particularly where delicate fishing is involved and a very low speed is needed for accurate work.

On power hoists, ratios are usually about 12 to 1, over-all, with speed-change points closer together. Six speeds are usual and are ample, although some eight and five-speed hoists are made. Special speeds are sometimes incorporated for "empty block" hoisting largely for convenience of gear changing. Normal hoist construction gives an even number of speeds by using two-speed-change shafts.

Engine-to-Hoist Ratio

Proper selection of the engine-to-hoist ratio is essential to obtain the best performance. This ratio is usually best set by setting the maximum empty-block line speed desired, with the normal number of lines strung, and setting the ratio for this speed. This should be calculated with the engine assumed to be running at full recommended normal speed and the line to be on the second layer on the drum. Individual preference may cause variations from this method but care should be taken to see that ratios are not used such that the highest gear is too fast for the derrickman to catch the elevators with the engine at normal speed. Rig sensitivity is handicapped in these cases, and the higher speeds are overworked disproportionately.

The question of grooved versus smooth drums is practically answered by the fact that, on multiple rope layer hoisting, the grooved drum is of little help in preserving the cable.

The brakes are the heart of the hoist and, if improperly designed and used, can be a major item on the operator's footage cost.

For good brake-drum life it is essential to keep drums as cool as possible and the best method of reducing brake heat, by far, is a hydromatic brake. Water-cooled drums are also fully justified by experience and have been developed to a satisfactory point by most well-known manufacturers. While brake friction square inches and linkage ratios are a measure of the retarding force which can be placed on the rim, the ratio between drum diameter and rope-spool diameter is just as important in determining brake power and should be watched by the purchaser. Narrow rope drums and "piled up" rope increase brake and rope troubles and reduce brake power. Extra-wide brake linings should be avoided because the heat of braking cannot be removed from the center of wide linings as fast as from the edges, because the lining is an insulator. The water or "hydromatic" brake still remains the most important money saver yet developed for a hoist, if properly used and of the right size, and should be installed wherever heavy work is expected of a rig.

Improved Brakes in Prospect

Development work is now afoot on improved types of brakes which have possibilities of changing the above picture. These are of the multiple-disk type using copper-base high-temperature friction linings and experience in the next few years should tell the story on this development. There is no doubt but the band brake now standard leaves much to be desired in all its phases except simplicity.

Wire line is one of the major consumable items on a rig, and poor choice of rig parts in contact with

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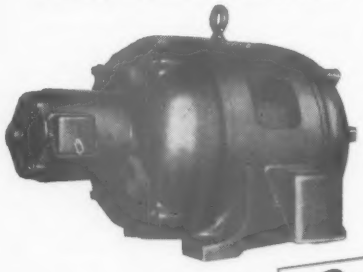

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Century Type SCT Splash Proof Pumping Unit Motors are engineered to assure continuous, economical pumping under the hazards of outdoor operation. They are scientifically "weather protected" against rain, snow, sleet, and ice.

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Century Explosion Proof Motors provide protection against varying degrees of explosion hazards—particularly for atmospheres containing explosive mixtures of gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors, or natural gas. They are ideal for refinery and bulk station operation —protect life and property, reduce insurance costs, and assure continuous production—Underwriters' Laboratories approved for installation in Class 1 Group D hazards.

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Consult your supply store or your Century Motor Specialist for complete information on all types and sizes of Century Motors and Generators for oil field use.

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the wire line can easily double or triple the cost over the best normal expectancy.

The chief cause of trouble with wire line is the drum. Shock loads from layer jumping, too light traveling assemblies, causing loose spooling when raising empty blocks with consequent cutting-in and slipping when lowering pipe, and poor spooling, all cause the line to suffer a severe mauling on the drum. The use of good spooling devices and heavy traveling assemblies helps considerably. Lines should be lubricated, if they start to dry out, with proper lubricant and not with crankcase drains or other makeshift oils.

Sheave grooves should be periodically checked to be sure they are of proper shape and, above all, ropes should not be used in either larger or smaller grooves than those designed for the rope.

Spudding the pipe with heavy loads on the hook places tremendous shock loads on the rope and should be avoided, as should sudden stops of the drill pipe at the rotary table. A good driller does not try to "catch the pipe" in the last few feet above the table.

Drum-spool diameter on the active layers is usually much too small for good rope life but should not be less than 25 times rope diameter. Block sheaves are much better sized as a rule—running up to 38 times rope diameter, which is highly desirable. For long life of sheaves and rope, this ratio should not be less than 35 times diameter.

Good practice is to cut off periodically a rope length equal to one or two drum wraps at the drum end in order to change the position of the layer jump. Some operators feel it is profitable to reverse lines, and purchase extra long lines for this purpose. If no accidents occur, causing major damage to the line, this is possibly justified. Quite often, however, removal of a damaged piece may leave the line too short for use and thus waste the extra line. Splicing of drilling lines is not safe.

Crown and traveling blocks are generally well designed but should be inspected for worn bearings and plates, and occasionally torn completely down for critical inspection of major parts for cracks and fatigue flaws. This is especially the case in hard rock drilling territory where the vibration loads are very severe in many cases.

Pipe-Handling Tools

Hooks, links, and elevators should be carefully watched for wear and should be occasionally inspected critically for fatigue cracks. Welding on this equipment should not be allowed since most parts are heat treated and heat may crack these vital tools and cause serious accidents. Repairs to major parts should be done by, or under the supervision of, the manufacturer.

Tongs, to obtain the best service, should be kept repaired and well lubricated. The dies should be kept cleaned of dirt and scale which clog and cause them to slip.

Slips of the one-piece type insure the best slip placement, less drill-pipe damage, better gripping, and longer slip life. Knurled teeth should be used, since horizontal continuous teeth definitely cause fatigue cracks and drill-pipe failure.

Automatic spinning-line catheads, or makeup catheads, operated by the driller, have become very popular in the last few years, especially on power rigs, and are a very desirable labor-saving addition. The conventional break-out cathead, either of the friction or jaw-clutch type, is standard equipment on rigs and all catheads should be kept properly maintained or they can be dangerous tools since, if accidentally engaged, they can cause serious accidents.

Of considerable interest is a fully automatic power-operated slip assembly which is now in the field-testing stage. This device has promise of being a useful tool if it is perfected and simplified.

Pipe racking on deep drilling is usually behind the finger but on shallower wells, in the Mid-Continent area, is still racked in front of the drum. No mechanical aid or tools are used by the derrickman other than pipe hooks and ropes.

Emil Kluth, of George F. Getty, Inc., elected chairman of the administration committee of the conservation committee of California Oil Producers, will have as his committee members **Henry F. Power,** General Petroleum Corp.; **Guy H. Cherry,** Five C Refining Co.; **R. A. Holman,** Amerada Petroleum Corp., and **T. H. Sherman,** Huntington State Co.

Roy J. Downey, formerly division chief clerk in the production department of Humble Oil & Refining Co. at New Orleans, has been promoted to assistant chief clerk in the headquarters office at Houston.

R. J. Rogers, of Guarantee Oil & Coal Co., Indianapolis, has been selected to fill the unexpired term of the late Phil T. Williams as president of Indiana Independent Petroleum Association.

R. P. Buchan, formerly production supervisor for Beech Aircraft Corp., Wichita, Kans., has been named district manager of Independent Petroleum Association of America for Kansas. Buchan majored in geology at Wichita University and formerly was an independent oil operator. He will continue to reside in Wichita.

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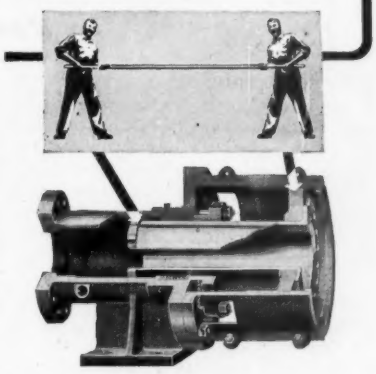

Slip Moves Through Packing Without Binding

Try to hold a pole at one end and keep it level. Then have someone hold the other end, and note the difference. That's precisely why the ADSCO Internally-Externally Guided Expansion Joint stays in alignment — why the slip moves through the packing space without undue pressure or distortion. This protection against slip scoring is the reason why the intervals between repacking are few and far between when you use ADSCO Internally-Externally Guided Expansion Joints.

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Well-Completion Methods In Ark-La-Tex Area

by Paul Reed

IN the completion of oil and gas wells of North Louisiana, Arkansas, and in adjacent areas of East Texas conventional methods are being modified by variations in certain operations. Some of this work is experimental. Other practices reflect policies being adopted for completing wells with methods which will procure more accurate data, facilitate more reliable operation, or solve unusual problems. The Ark-La-Tex area has frequently been regarded as a proving ground for advances in completion methods. In this connection, some of the early work with gun perforating and plastics has been cited as examples.

Some operators are emphasizing the importance of extensive drill-stem testing for securing desirable data regarding formations since water conditions may change after the casing has been run and cemented. In some cases there is a practice of doing considerable side-wall coring of possible producing formations which have not been cored in drilling.

There has been an increasing amount of perforating and testing done with combination gun perforating and drill-stem testing equipment run in the well after casing has been set through the producing formation. By this method perforating can be done with a few shots at a time in certain zones or by shooting all of the shots at once. Results of shooting can be tested when desired by raising the equipment and setting the packer of the drill-stem testing tool. By this method, perforating and testing can be done by successive stages with a saving of the time required for going in and out of the hole.

Acidizing through the drill-stem tool and perforations in the casing has been done to some extent in the Carthage field by methods which have been applied in other fields.

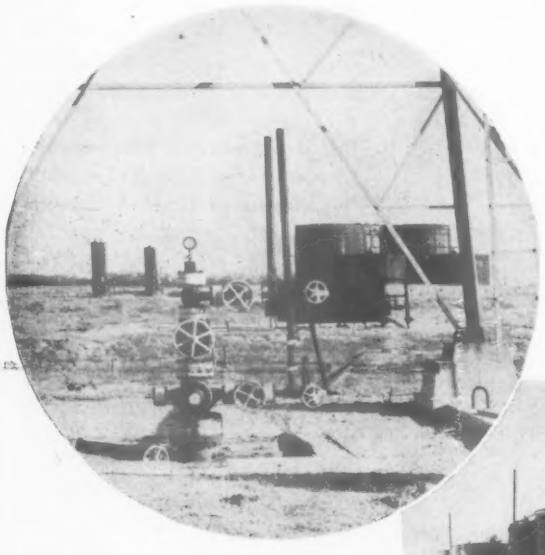
Within recent months more use has been made of gamma ray and neutron (radioactivity) surveys in both original completion and recompletion work in the Ark-La-Tex area. The example of a major company which makes a practice of having all new wells surveyed by both electric log and radioactivity methods has stimulated consideration of such a policy. Advantages of radioactivity surveying, as an original completion operation, are summed up in the following way: With the growing recognition of the value of gamma ray and neutron surveys for recompletion and secondary-recovery operations, it appears that the data from such surveys are likely to be desired at some time in the future. Radioactivity surveying at the original completion is done when the details of drilling are fresh in the minds of those in charge of operations.

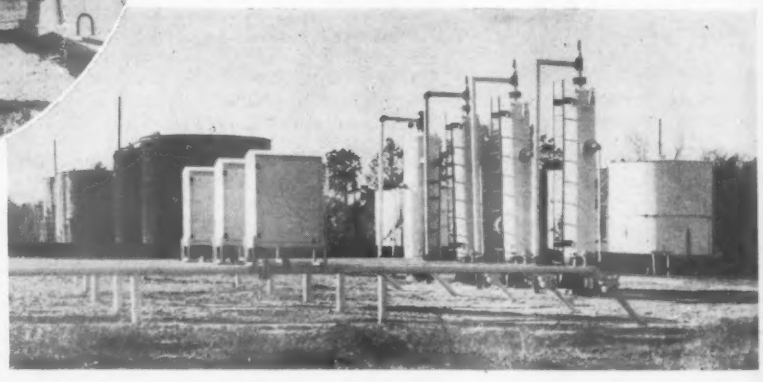
Within recent weeks several major companies have run radioactivity surveys in connection with recompletion work in the Rodessa field This field was developed originally in a period before electric surveys were made with the refinements characteristic of them in recent years. Furthermore, there have been errors made by some operators due to not adjusting measurements from those on the rotary table to those later used at the surface of the ground. By reperforating and squeezing according to additional information furnished by gamma ray to determine formation tops and in some cases also by neutron ray surveys to furnish data on hydrogen content to indicate the porosity of the formation, it has been possible to increase production in some wells from a few barrels to 40 to 90 bbl. daily. Economies effected by radioactivity surveying have been demonstrated by comparing results of recent recompletion work in the area where such surveys were not used.

Limestone Formations

In an effort to obtain as much data as possible for the study of permeability of subsurface formations, there has been more frequent use of the Electric Pilot survey which is yielding results that may change established practices, particularly in pools producing from limestone formations.

Wider use of bottom-hole chokes is being adopted to safeguard flowing wells. Within the past year there have been a number of wells damaged by water intrusion which seemed to be unwarranted according to data available at the time of completion and subsequently. The reasonable assumption was that the switcher had flowed the well at some





Above: Well connections, heaters, separators and tankage, Magnolia, Arkansas, field. Right: Facilities for handling sour and sweet oil and gas production from a dually completed well in Dorcheat-Macedonia, Arkansas, field

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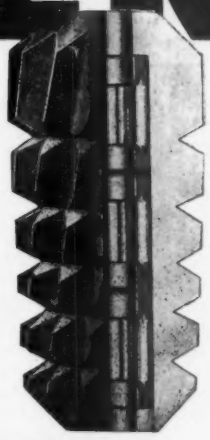

The GRANT REAMER with roller bearing cutters is the ideal tool for reaming all types of formations. It is equally satisfactory in hard rock or in sticky shale. The efficient performance of this reamer has made it a favorite the world over.

- Cutters are set at the correct angle in the body to produce a shearing-chipping action that assures full-gauge, clean hole through any formation. Also, the cutter design and the "angle of set" prevent the reamer from threading itself into tight hole.
- The reamer body is streamlined to allow maximum clearance which permits faster rotation and allows the free flow of the drilling mud.
- One reamer, or two in close tandem, above the bit will centralize and stabilize the drilling tools and at the same time keep the hole clean and to full gauge.
- The highest quality materials and workmanship combined with proper functional design assures more footage with less servicing than any other similar tool available.

REDUCE PIN WEAR... INCREASE CUTTER LIFE

Minimum pin wear, maximum freedom of rotation and increased cutter life result from the advanced design of the GRANT REAMER. One important feature of this reamer is that either the pin end or box end can be run up by simply reversing the cutters. Regardless which "end-up" is run, cutters and pins are securely locked in position.

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time at a faster rate than had been prescribed for safe operation by company engineers, or the original calculations were incompatible with physical conditions.

There has been some reconsideration of the relative merits of setting casing at the top of the producing formation and of landing pipe through the formation and perforating according to the modern practice which is adopted in the majority of completions. In the development of the Magnolia (Arkansas) field, there are several cases where offset properties have wells completed according to each of these practices. When the production life of the field is further advanced, it may be possible to compare significant results. At present, production from wells from similar structural conditions is much the same, even though completions have been made according to each of these divergent methods.

An innovation in completing may be observed at the north end of a field which produces almost entirely from the Smackover limestone. The well was plugged back from the Smackover and sold after testing a Cotton Valley lens where only water was found during testing. The purchaser equipped the well with a unit for sucker-rod pumping. After several weeks of pumping water, a separator and tank were installed. Pumping of water has continued with a small amount of oil but not sufficient, according to latest reports, to warrant application for a pipe-line connection. The experiment is being watched as an innovation in the area, by which an attempt is being made to lower the oil-water contact in the lens in order that oil may be produced.

Mellon Institute Offers Results of Two Studies

Mellon Institute of Industrial Research, Pittsburgh, has completed two scientific studies and is offering results of its work to interested engineers, according to W. A. Hamor, assistant director.

Hamor has announced that reprints are available of articles entitled "War Research at Mellon Institute 1944-45" and "A Rational Examination of Stream Pollution Abatement."

Mark Kirkpatrick, on leave from Pure Oil Co., has been made assistant director of the supply and transportation division, Petroleum Administration for War, in District 2. He succeeds **John A. Turner,** who reentered private business. Kirkpatrick, whose new office is in Chicago, had been transportation analyst for PAW in Washington since last February.

Tide Water Associated Operates Ultramodern Aviation-Fuel Plant

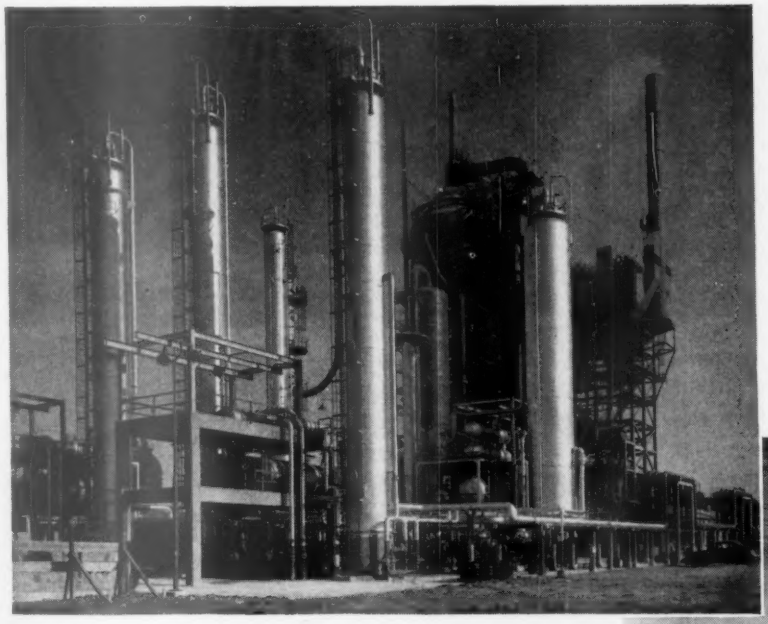
TIDE WATER ASSOCIATED OIL CO. emphasized flexibility and operating versatility in the design of its Avon, Calif., plant for manufacturing 100-octane-number aviation fuel. To its thermal cracking, thermal polymerization and sulfuric acid alkylation units which were in operation before the start of World War II, the company added the largest single Fluid catalytic-cracking unit in the world, the first pentane isomerization plant of its kind to be constructed. Other sundry additions were made such as those to alkylation facilities, superfractionation, etc.

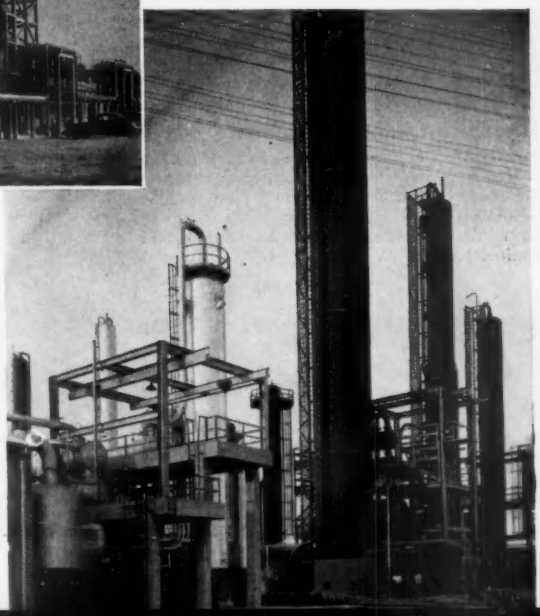
The pentane isomerization plant, a Shell Development Co. licensed process, employs a catalyst the active ingredient of which is anhydrous aluminum chloride. The charge stock for the alkylation plant is obtained from the thermal-cracking unit which is operated at severe conditions for a maximum of olefins; from the catalytic-cracking unit, which produces quantities of butylene, amylene and isobutane; and from the butane-isomerization unit. The butane-isomerization unit operates in the vapor phase using Isocel catalyst — anhydrous aluminum chloride with an earth-type supporting base—and with anhydrous hydrochloric acid as promoter. This unit has six separately controlled exchanger-type reaction chambers and two HCl stripper columns.

The Fluid catalytic-cracking unit charges 16,000 bbl. of gas oil per day, cracking 72 per cent of it to aviation base stock and lighter materials. These severe conditions produce large volumes of isoparaffins and olefins for the alkylation and polymerization units. The aviation stock is rich in aromatics and isoparaffins. This unit charges the gas oil vapors to the reactor in contact with the finely ground synthetic catalyst made by American Cyanamid & Chemical Corp., having about the same chemical composition as the natural montmorillonite—a nonswelling bentonite — catalyst but more rugged, porous, more active and stable than the natural catalyst at high temperatures. Feed to this unit is in part the virgin gas oil from San Joaquin Valley crudes, plus gas oil from a viscosity - breaking unit, and a heavy gas-oil stock from a vacuum unit processing heavy residual oil which is flashed under 50 mm. of mercury total pressure in a vacuum column at about 690° F. This unit can take 10,000 bbl. per day of gas oil overhead and the heavy bottoms are cracked in the viscosity-breaking unit nearby. The combined charge stocks are heated in heat exchangers to about 400° F. and mixed with hot regenerated catalyst at 1,050°-1,100° F., which brings the oil to the cracking temperature after which it enters the reactor in the bottom section of which a substantial level of catalyst is maintained. This reactor is 27 ft. in diameter by 54 ft. high with cone top and bottom. Floating catalyst and reaction vapors pass through the Multiclone unit which recovers most of the catalyst and returns it to the system. Vapors pass to the fractionating tower; spent catalyst goes to the regenerator from which flue gases with some catalyst entrained pass to waste-heat boilers and to the Cottrell precipitators to catch the last of the catalyst.

The catalytic naphtha is split into two fractions, the lighter boiling up to about 200° F. end point and the intermediate cut having a 220°-340° F. boiling range. Both are treated with 15-20 lb. of spent alkylation acid per barrel of naphtha in a countercurrent refrigerated plant at 60° F., and the naphtha is rerun afterward to make finished aviation-fuel base stock. An old thermal-cracking unit is run as a reforming unit on heavy naphtha at 1,110°-1,135° F. transfer temperature and making 7 per cent of butylenes.

The superfractionation unit includes nine towers designed to separate close-cut fractions of isomers.





Left: Avon catalytic cracking plant of Tide Water Associated Oil Co. showing gas-recovery stabilization towers in foreground. Below: Recent additions to the Avon alkylation plant

"Expansion Joint Problems ?"

ADVANTAGES OF COOK "MAGNILASTIC" EXPANSION JOINTS

While overcoming the ten extraordinary conditions as shown at the right, "MagniLastic" offers additional characteristics which present further engineering advantages as follows:

Dependability

Performance of "MagniLastic" expansion joints has proven that with the incorporation of new designing principles and employment of appropriate metals, the expected service life is almost unlimited.

Predetermined Travel Ratio

Because of their method of construction, Cook "MagniLastic" bellows can be designed for use at predetermined travel ratios, thus giving an exact amount of travel at any required pressure. This is accomplished by employing the correct metal and through the proper designing of flanges and flange span dimensions and contours.

Resistance to Corrosion

Where corrosive factors must be considered, "MagniLastic's" use of all metals and the techniques used in joining these metals can readily overcome such conditions.

Savings in Maintenance Costs and Time

In most cases, the installation of a "MagniLastic" expansion joint means the installation of a unit whose life will exceed that of the entire project. Production loss due to replacement and maintenance is therefore, avoided.

Each Expansion Joint "Custom-Built"

Cook "MagniLastic" expansion joints are "custom-built" to meet the requirements of each specific application for which they are designed. While many of the sizes and flange types have become standard in a sense that the design itself has found repeated uses, each application is especially engineered to meet the exact requirements of the application. Each application is thoroughly examined and the appropriate metals, flange design and type of metal joining is specified in the design by "MagniLastic" engineers. Thus, each bellows is a "custom-built" job, especially suited to your needs.

All Sizes—All Shapes—Unlimited Lengths

"MagniLastic" expansion joints have been designed for service where round, oval and rectangular shapes have been required. They can be designed up to 72" in diameter and, because of their method of assembly, can be produced in unlimited lengths.

ABOVE — Expansion joint, 36" I.D., designed for 6" travel for high temperature line.

We welcome the opportunity in serving your specialized requirements. We are in a position to give you a quick estimate and furnish you assembly drawings, if the following information necessary to design the expansion joint is furnished by you.

1. Sustained maximum pressure and surges to which the expansion joint will be subjected.
2. Maximum and minimum operating temperatures to which the expansion joint will be exposed.
3. Corrosion factors in terms of the nature and kind of gases or fluids with which it will come in contact.
4. Desired amount of movement whether expansion, contraction or total movement, and the estimated number of full movement oscillations to which the expansion joint will be subjected in a given period of time.
5. The limitations as to physical size and mounting or end fittings.

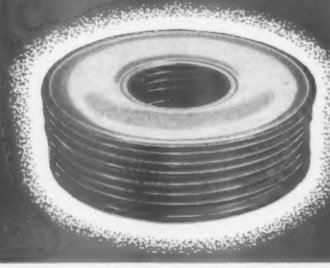
"MagniLastic" bellows, while generally associated with use as expansion joints, are also employed as flexible joints, bellows pistons, bellows valves, packless valves, bellows seals, revolving seals, equalizer units, flexible couplings, alignment members, swivel action joints, shock and vibration dampeners, hydraulic accumulators, dynamic actuators and many other applications.

SEND FOR CATALOG BG-2 FOR THE COMPLETE STORY OF COOK BELLOWS

Practice Packless Hydraulics with

MAGNILASTIC

RIGHT — Section of a "MagniLastic" bellows used on large packless vacuum valve. Bellows are made of Monel, atomic welded, micron tight, and have a travel range of three times their compressed length. They are used on valves up to 16" inclusive.



MAGNILASTIC *Can* Solve Them!

A bold statement . . . but here are the facts

In every case where Cook engineers have had requests for assistance, they have overcome problems of—

1. Extraordinary sizes or capacities
2. Abnormal temperature ranges
3. Tensile strength and creepage of metals
4. Corrosive factors as affecting flange metal or brazing and welding fluxes or materials
5. Excessive pressures
6. Porosities of metal and joints which are specified in fractional microns of vacuum or leak rate
7. Abnormal travel ranges and lateral deflections
8. Heavy duty service as imposed by shock or surges
9. Vibration factors and internal turbulance
10. Unusual limitations in flange span dimensions

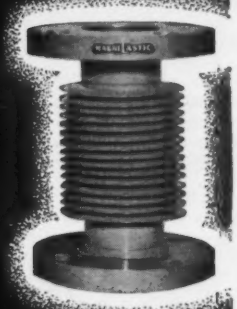
Cook "MagniLastic" expansion joints were originally developed to meet specifications where the ordinary, conventional type of expansion joint just wouldn't do. "MagniLastic" bellows are different in principle, different in design and different in the type of service they will render. These expansion joints are not "crushed" together, they are formed and assembled. The patented design employs new engineering principles of design and fabrication.

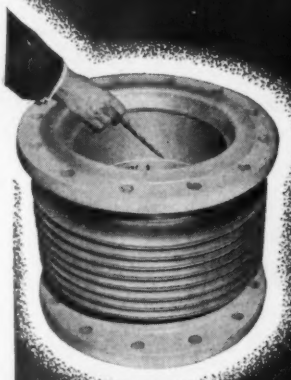
The use of all types of metals, such as nickel, Everdur, copper, beryllium copper, high tensile steels, stainless steels, Monel, Inconel, Kovar, Fernico, etc., and the use of all advanced and many secret metal joining processes, enables Cook craftsmen to produce these outstanding units. "MagniLastic" is a great stride forward in keeping pace with all of the unusual requirements necessitated by advanced processes, designs and increased production demands of all industries.

The column at the far left explains the extraordinary advantages of "MagniLastic" design and the illustrations show a few of the hundreds of new, successful developments of "MagniLastic."

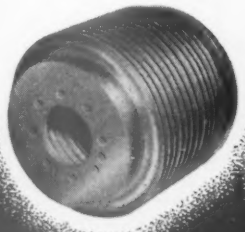
LEFT—A new vacuum and medium pressure expansion joint made of Monel metal, for pressures ranging from 0 to 55 lbs. p.s.i. Total travel is ½" on compression or expansion. Cycleage in average use upwards of 10⁶. Temperature range —300°F. to 900°F. For corrosive gases or liquids.

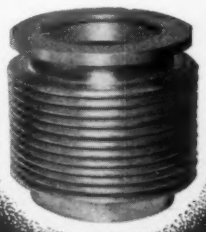
RIGHT—Special copper brazed steel heat treated bellows for temperatures as high as 500°F. For pressures up to 600 lbs. p.s.i.





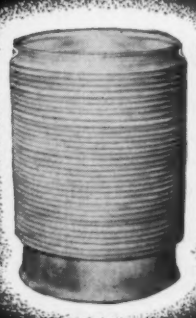
LEFT—Special large size expansion joint, Vanstone lap and inner liners made of stainless steel, atomic welded and provided with series 150 end flanges. This expansion joint was designed for use on a 550°F. line, 150 lbs. pressure p.s.i.





ABOVE—Welded Inconel expansion joint with special end fittings. This expansion joint was designed to meet critical corrosive conditions for a special restricted application.

RIGHT—High temperature narrow span exhaust bellows for absorbing the expansion of exhaust piping systems used in Diesel aircraft and similar high temperature lines suitable for temperatures of 1700°F.



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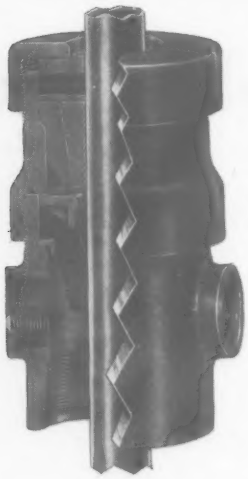

BEST TUBING HEAD BUY *for* GAS LIFT WELLS *Larkin*

CHECK THESE VALUABLE LARKIN FEATURES:

1. Forged steel . . . 4,500 pound test
2. Neoprene stripper
3. Full opening for tools or packers
4. Complete interchangeability of parts
5. A blowout preventer and oil saver when running or pulling tubing
6. Easily convertible, flowing to artificial production
7. Low first cost...negligible upkeep

LARKIN

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More than ever, operators are turning to Larkin Type SR Tubing Heads when converting to gas-lift. Although low in cost, this forged steel head has more than sufficient strength to support any length of tubing, and is tested to 4,500 p.s.i. The neoprene stripper provides blowout preventer protection while pulling or running tubing.

Above is shown a Larkin Tubing Head on a typical flowing well hookup. The head need not be removed through the entire life of the well.

The Larkin Tubing Head is suitable for any pumping well installation (see above). It assures every protection required.

XUM

Removal of Drilling Mud From Well Faces

Mud penetration into producing formations.—In oil wells which are completed in highly permeable pays of low pressure, drilling mud may penetrate the face of the formation and reduce its permeability. In most places, fortunately, the penetration is not deep, probably not exceeding 1 in. at the most. In cases, however, where wells were allowed to stand for some time full of drilling mud in contact with very permeable limestone pays, the mud fluid has been known to penetrate so far that it was pumped from an offset well. In still other places, little if any penetration takes place but a mud sheath forms around the periphery of the hole in the form of a hard cake of dense, calcareous clay which needs to be removed before the well will produce to capacity.

Methods of removing mud.—In the case of low-pressure wells where danger of a blowout does not exist, it is good practice to ream the pay face and remove the mud sheath and penetrated mud with a wall scraper or reaming bit.

Perforated pipe or screen with back-pressure valve and set-shoe assembly may be set through the sand. Then the face of the sand is washed by forcing fluid down the tubing and back through the annular space between tubing and casing. In such places the perforated pipe or screen acts as a support for the mud sheath, and complete removal of the mud is difficult if not impossible. For this reason engineers sometimes advocate completing a well with acid-soluble mud, then dissolving and removing mud sheath with acid.

Many experienced operators consider that the mud sheath built upon the face of the sand can be readily dislodged by alternating the rate of flow in the well, and all that is needed is a rapid swabbing of the hole. A difficulty is that the face of the formation cannot be seen and the only way one can judge the amount of mud removed is by the performance of the well after the perforated pipe has been set and the well put on production. The fact remains that the cause of many poor producing wells has been traced to mud penetration. Morris[2] points out that out of 500 chemical clean-out treatments of oil wells in California, 450 of the jobs were carried out for the purpose of removing mud sheaths.

In chemical treatment to remove mud, dilute acid is generally used. A difficulty may be that the mud is tightly compacted and in many places mixed with so much oil that the fluid does not penetrate the sheath, and disintegration of the sheath is slow. The surface of the pay should be covered with acid. Repeated washing and renewal of acid may be required, thus taking out a little mud with each washing until the hole is clean. Morris' field experiences are in agreement with laboratory experiments at University of Texas that chemical treatment of mud is more effective if undertaken before oil becomes mixed with or covers the mud sheath. Agitation of treating fluid by frequent removals from hole, by swabbing or by pressure washers accelerates action of liquid on the sheath and generally makes results better. A simple washing tool shown in Fig. 1 is described by Suman[3]. Two packers are set about 3 ft. apart on the swabbing tool. The tool is tilted with a valve on the bottom and perforated between the packers so that the fluid pumped in must flow out between the packers. The packers are made to fit closely against the oil string in which the tool operates.

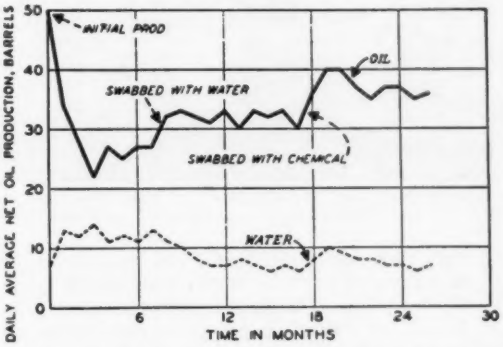

Fig. 2—Effect of chemical treatment for mud-sheath removal. The treatment was carried out through perforated pipe which was down-and-up swabbed with water prior to the application of the chemical. (After Winter)

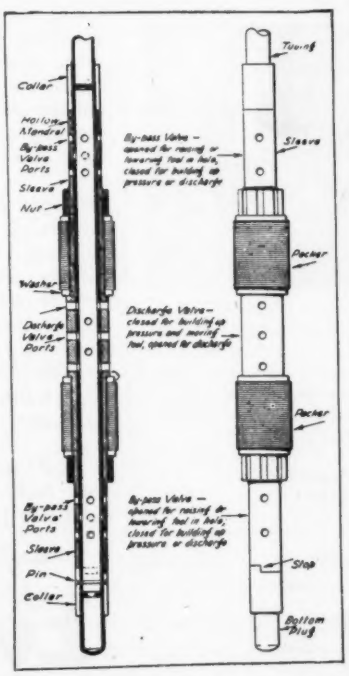

Fig. 1—Special swab known as Holliday two-packer perforation cleaner used for cleaning perforated pipe and screens in oil wells. (After Suman)

Results of chemical treatment for mud removal.—Morris reports the case of a well in a low-pressure sand in the Buena Vista field, California. The well was drilled with highly colloidal mud and when completed produced a little oil. Repeated bailing tests after vigorous and continuous swabbing showed a productivity of less than 5 bbl. of oil per day. After treatment with chemicals and swabbing for 6 hours, the well was completed making 40 bbl. of oil per day. Other results of chemical treatment are shown in Fig. 2.

References

1. Miller, H. C., and Shea, G. B., Chemical Method of Removing Mud Sheaths in Oil Wells: U. S. Bur. Mines Rept. Investigations 3249, 1934.

2. Morris, M. W., Chemical Clean-Out of Oil Wells in California: A.P.I. Inst. Drilling and Production Practices, pp. 220-228, 1938.

3. Suman, G. O., Flooding, Washing and Hydraulicking Wells: Oil Weekly, Vol. 61, No. 10, pp. 31-38, May 22, 1931.

Series prepared by F. B. Plummer, professor, petroleum engineering school, University of Texas

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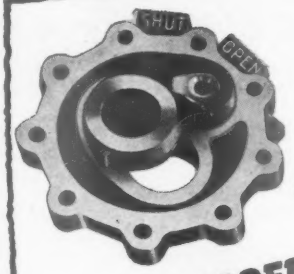
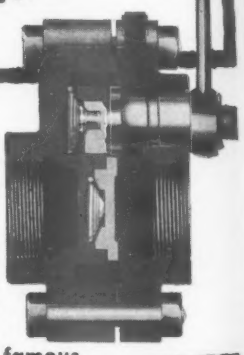


better than hand-lapped

A SELF-LAPPED VALVE SEAL!



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This valve disc does not merely slide open and closed, as in the usual gate valve. This disc actually *rotates* within the disc-arm as it moves across the seat . . . SELF-LAPPING these sealing faces to microscopic precision. And the disc travels in constant contact with, and on, the seat table—they're never separated—so no grit or other substance can lodge between these sealing faces. The EVERLASTING drop-tight seal truly *improves with use!*

IMPROVES WITH USE

Changes of temperature cannot cause this valve to bind, because *all parts* function in a parallel plane . . . are free to self-compensate any expansion or contraction of individual parts. The disc, like all other internal parts, cannot become loose and choke the straight-through flow. And, since there is absolutely no wedging action in this valve—it *cannot stick!*

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XUM

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Tower Capacity

THE capacity or diameter of a conventional bubble-plate type of fractionating tower is primarily dependent on the amount of reflux that it must handle although there are many other factors that influence its capacity. These factors, arranged somewhat in the order of importance, are:

1. Hot reflux.
2. Amount of overhead and side-draw products.
3. Pressure or vacuum.
4. Mol weight or kind of overhead product.
5. Tray spacing.
6. Number of trays.

In addition, the design of the bubble tray, the density of the liquid reflux, the use of side reflux (see Notebook No. 55, August 18), and the extent to which the feed is vaporized, affect the tower capacity to only a small degree. A side-to-side pan construction rather than conventional bubble trays, increases the capacity greatly but such towers are longer than regular bubble-tray towers because a large number of pans is required to accomplish the fractionation. Details of tray design will be discussed in Notebook No. 51.

The single most important factor is the hot or internal reflux because in addition to the overhead product the trays must handle the (reflux) vapor that travels to the top of the tower. This often amounts to several times as much material as the overhead product (ratios of hot reflux to product are 1:1 to even 15:1). The amount of hot reflux may be computed by means of the methods outlined in Notebook No. 45 (Tower Heat Balances, June 9, p. 109) and No. 46 (Types of Reflux, June 16, p. 143).

The effect of pressure on capacity is interrelated with the molecular weight or kind of overhead product because these two factors govern the density of the vapor. A dense vapor tends to carry or entrain liquid from one tray to the next but in spite of this effect the capacity of a tower that operates at a high pressure is greater than

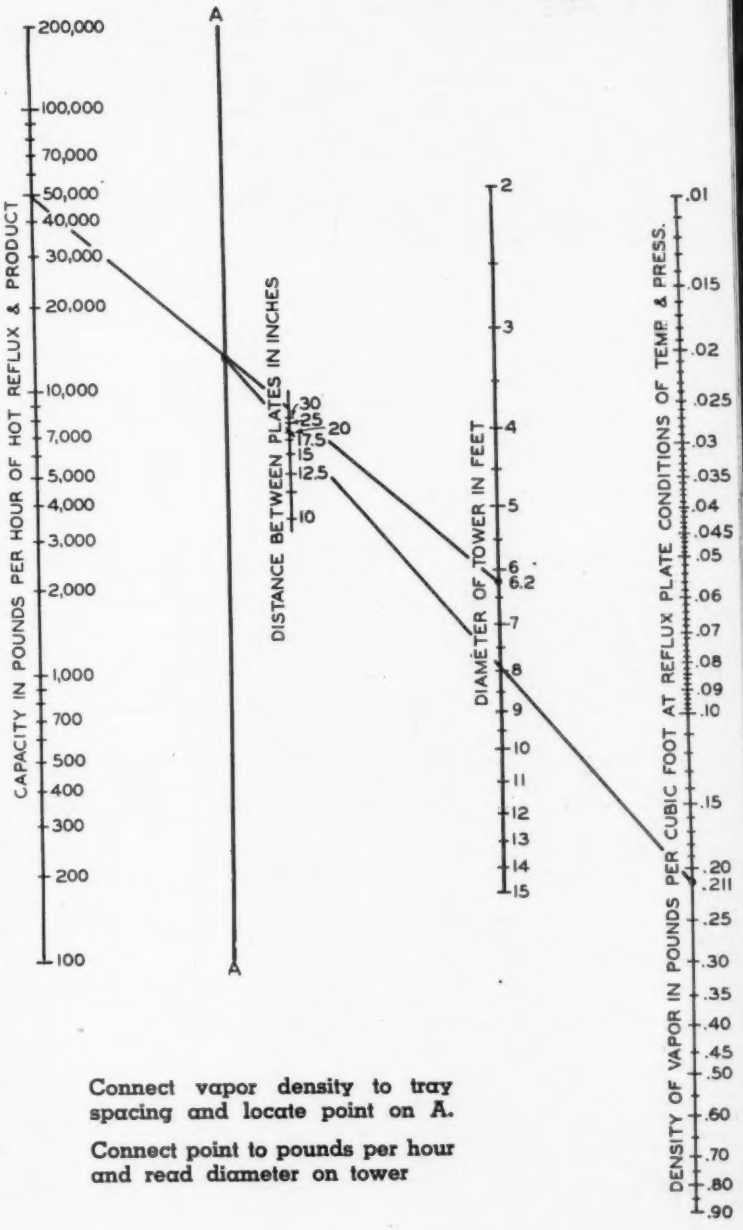

Fig. 1—Diameter of fractionating tower

No. 50 in α series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

one that operates at a low pressure. The general effect of pressure on the capacity of topping or cracking towers (the overhead product is gasoline in both of these) is somewhat as shown in Table 1.

TABLE 1—EFFECT OF PRESSURE ON TOPPING AND CRACKING TOWERS

Pressure—	Ratio of capacity: Based on 1 psig.	Based on 40 psig.
4-lb. vacuum	0.81	...
1-lb. gage	1.00	...
6-lb. gage	1.12	...
10-lb. gage	1.20	0.69
20-lb. gage	1.41	0.80
30-lb. gage	1.59	0.91
40-lb. gage	1.75	1.00
60-lb. gage	2.00	1.14

Example.—Fig. 1 permits rapid estimates of tower diameter, or the capacity of an existing tower. Notebook Nos. 45 and 46 provide data by which a tower diameter may be selected. For a 4,000-bbl.-per-day topping plant the amount of internal or hot reflux is 42,500 lb. per hour (Notebook No. 46, June 16, 1945, p. 143) and the amount of overhead products (Notebook No. 45, June 9, p. 109) are:

	Lb.	Mol. wt.	Mols
Gas	245	35	7.0
Aviation gasoline	4,930	96	51.4
Hot reflux	42,500	96	443.0
Steam	2,182	18	121.0
Total	49,857		622.4

The aviation gasoline and reflux have a mid-boiling point of about 200° F. (Notebook No. 31, February 24, 1945, p. 151) and a molecular weight of 96 according to Notebook No. 47, June 23, 1945. The volume and vapor density (see Notebook No. 47) for a tower pressure of 5 psig. (19.7 psig.) and the top temperature of 240° F. (700° F. abs.) may be computed thus:

$$\text{Volume} = 622.4 \times 10.73 \times \frac{700}{19.7}$$
$$= 236{,}000 \text{ cu. ft. per hr.}$$

$$\text{Vapor density} = \frac{49{,}857}{236{,}000}$$
$$= 0.211$$

Connect 0.211 on the right scale of Fig. 1 with 22 (tray spacing) on the small scale to locate a point on the A scale. This point is connected with 49,857 on the left scale, and the diameter is read as 6.2 ft.

SCHEDULE OF TOPICS

Previous schedules of topics show that the following discussions have appeared:

No. 19—November 25: Crude Storage (13 issues)
No. 26—January 13: Crude Properties (6 issues)
No. 29—February 10: Crude Analysis (6 issues)
No. 35—March 24: Topping Processing (9 issues)
No. 43—May 26: Vaporization (7 issues)

Physical and thermal design data have been discussed in the following recent issues:

No. 38—April 21: Vapor Pressure
No. 40—May 5: Heating Liquids
No. 42—May 19: Heating Vapors
No. 43—May 26: Latent Heat
No. 47—June 23: Vapor Volume and Molecular Weight

The schedule of topics now appearing:

No. 44—A.S.T.M.—True Boiling Point Curves
No. 45—Tower Heat Balances
No. 46—Types of Reflux
No. 47—Vapor Volume and Molecular Weight
No. 48—Tower Temperatures
No. 49—Weight of Towers
No. 50—Tower Capacity
No. 51—Tray Details
No. 52—Stripper Temperatures

Topping Towers

A short-cut method of estimating the diameter or capacity of topping towers is indicated in Fig. 2. This is based on the empirical relationship:

$$\text{B.P.D.} = \frac{1{,}000}{4.5} (\text{Dia.})^2 (\% \text{ Resid.})$$

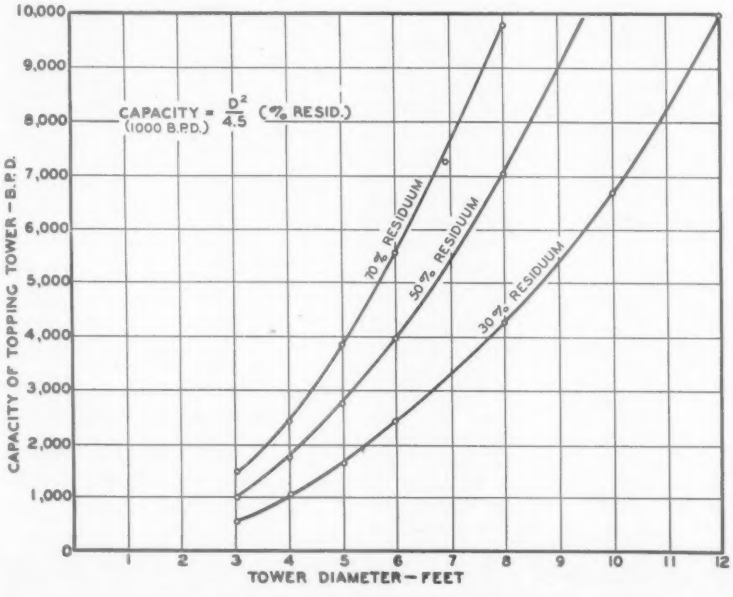

Fig. 2—Approximate capacity of topping towers

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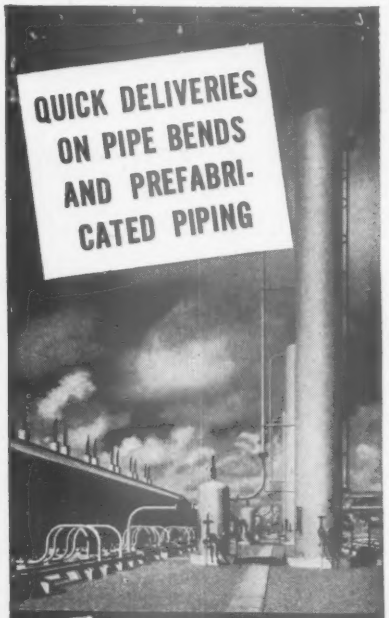
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REFINING

Shell Now Producing Allyl Chloride and Allyl Alcohol

HOUSTON.—Shell Oil Co., Inc., has placed in operation at its Houston refinery the new allyl unit, first in the country to begin commercial production of allyl chloride and second to begin commercial production of allyl alcohol.

One of the chief uses of allyl chloride is production of pain-easing drugs, including sedatives, hypnotics, diuretics and anaesthetics. Probably the best known is cyclopropane, which puts the patient to sleep quickly and with a minimum of after effects.

Allyl chloride is also the raw material for a vasoconstrictor drug used for colds, allergic rhinitis, hay fever and sinusitis, particularly as they affect aviators. Allyl chloride is expected to be the starting point of a broad new field of plastics and resins based upon carbohydrates, such as starch, cellulose and sugar.

Allyl alcohol, the other member of the Shell allyl twins, opens the way to a group of allyl resins, which represent a new type of plastics. Reacting with other chemicals, allyl alcohol forms a liquid which hardens into a transparent solid with a glossy surface. Since the material is formed without the enormous pressures needed in most plastics, laminates of the allyl resins can be made, not only in flat sheets, but also in complex curved shapes required in airplane parts and machinery housings. These laminates are as strong, in proportion to their weight, as any structural material yet devised.

Midwestern Refiners May Cut Diesel Fuel Output

WASHINGTON.—Refiners in the Midwest will be able to reduce their output of Navy 7-0-2 diesel fuel oil 30,000 bbl. daily as a result of additional oil supplies from foreign sources and from other regions in this country. This will enable these refiners to build home-heating oil stocks to adequate levels.

Petroleum Administration for War has worked out with the Department of the Navy a program involving readjustment of supplies on a world basis. The cut in diesel fuel production from 50,000 to 20,000 bbl. a day, it is hoped, will permit the same allowance for home-heating oil as was in effect last year without involving replacement of kerosene and distillate from uneconomical sources, but the oil industry will be strained to supply both military and civilian demands.

The cut will make possible the re-

Sketches of Plant Operators

MILTON S. BERINGER, new general manager of the manufacturing department of British American Oil Co., Ltd., is a graduate in chemical engineering from Texas A. & M. College and has had wide experience in refinery construction and operation both in the United States and abroad. He succeeds L. E. Woolley, who retired owing to ill health.

Before joining British American in 1934, Beringer was associated with the old Sapulpa Refining Co., Continental Oil Co. and Arthur G. McKee Engineering Co. He supervised construction for British American of the company's Turner Valley absorption plant, Calgary refinery, Montreal refinery extensions and the new high-octane gasoline and lubricating-oil refinery at Clarkson, Ontario. In 1943, Beringer was appointed assistant to Woolley.

sumption of some shipments of home-heating oil and kerosene to the East Coast states (PAW District 1), which count heavily on supplemental supplies to satisfy demands in that area.

Pure Beats Schedule in Toluene Contract

CHICAGO.—A supply contract for 10,000,000 gal. of toluene for the U. S. Army Ordnance Department has been completed 9 months ahead of schedule by The Pure Oil Co. The original contract has been expanded, and toluene production for several months scheduled.

Venezuela May Refine Its Own Oil Within 3 Years

CARACAS. — Venezuela — the world's second largest oil producer —should be able to operate its own refineries, within the next 3 years perhaps, according to the report of a Senate committee. Initial operations should utilize about 135,000 bbl. of crude daily, the report said.

Venezuelan crude is refined now in the nearby Dutch Island of Aruba and in the United States. Creole Petroleum Corp., a Standard Oil Co. (New Jersey) subsidiary and the largest oil company in Venezuela, has contracted with the Venezuelan Government to erect a modern refinery in Venezuelan territory, with a minimum daily capacity of 40,000 bbl.

Pursuant to an agreement made in 1943, the Shell Group plans to build a refinery in the southwestern part of the Paraguaná Peninsula, east of the Gulf of Maracaibo, at a site near Punta Cardón. The plant, costing over $33,300,000, will have a daily throughput capacity in excess of 40,000 bbl. with ample cracking and auxiliary facilities including provision for the manufacture of aviation gasoline and lubricating oils. The refinery will have terminal and loading facilities, housing accommodations for employes, hospital, sports ground, etc. Preliminary survey work has already been done at the site, and it is expected that work on temporary camp facilities will start as soon as materials are available.

Posthumous Honor Goes to Victims of Explosion

CHICAGO. — Four research experts who met death in May 1944 when a flame thrower exploded at the Whiting, Ind., refinery of Standard Oil Co. of Indiana, have been honored posthumously in certificates of merit awarded by Office of Scientific Research and Development. They were Frank V. Ovitz and James G. Nellis, chemical engineers; John Leonard, engine mechanic, and John J. Hanusin, engine laboratory foreman. Eight others who worked on the project but escaped death, received similar awards.

Forwarding the certificates to the widows of the four, Dr. Robert E. Wilson, chairman of the board of the company, said that "the contributions they made for victory were as real in every sense as those of our troops in battle. The development program on which they were working was of real importance in advancing the flame thrower to the important place on the battlefield which it occupies today."

The eight others honored were E. R. Barnard, assistant director of research; Dr. T. H. Rogers, associate director; James A. Bock, chemical engineer; George Hajduk, technician; Bernard J. Lotkowski, machinist; E. T. Molson, engine mechanic; W. A. Proell, chemist, and R. B. Terry, chemical engineer.

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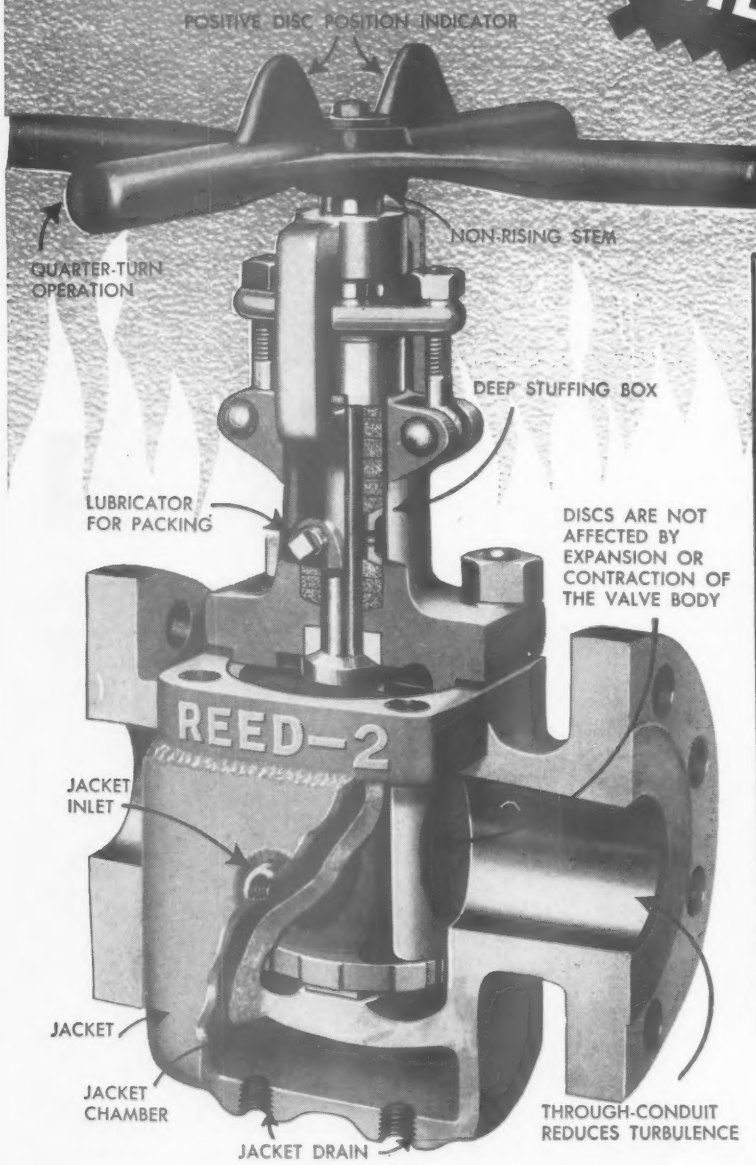

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Natural Gas

Texas Plans to Take Part In Natural-Gas Hearings

AUSTIN.—Preliminary plans for the part which Texas will take in the forthcoming investigation of the natural-gas industry by Federal Power Commission were discussed last week at a meeting of the special committee appointed by Governor Coke Stevenson.

The committee, headed by Olin Culberson, who also is chairman of the State Railroad Commission, named subcommittee chairmen as follows to urge the state's claim to control of gas: Legal, Charles I. Francis, Houston, chairman; economy, D. A. Little, Dallas; engineering, E. DeGolyer, Dallas.

Attending the meeting in addition to Culberson and Matson Nixon, of Corpus Christi, vice chairman, and the subcommittee chairmen were George A. Hill and David Gray, of Houston; R. C. Kay, of Amarillo; J. S. Bridwell, of Wichita Falls, and B. G. Byars, of Tyler.

Revised Rates Tendered By Two Gas Companies

WASHINGTON.—Revised rate schedules for natural gas sold at wholesale have been tendered by Canadian River Gas Co. and Colorado Interstate Gas Co. for filing with Federal Power Commission. The commission will study these new rates to determine whether they carry out the reductions provided in the commission's orders of March 18, 1942, as amended April 14, 1942. The orders, sustained by the Supreme Court of the United States, directed Canadian River to reduce its interstate wholesale rates by not less than $551,000 annually, and Colorado Interstate to reduce its rates by at least $2,065,000 a year. Reductions were to be effective on all bills on and after May 20, 1942. Pending settlement of the matter Colorado Interstate has been impounding funds at the rate of $2,065,000 a year, and Canadian River has posted bond for $561,000. The amount impounded by Colorado Interstate to the end of May 1945 was $6,471,565. The amount to be refunded will depend on the rate schedules ultimately approved by FPC.

Canadian River produces and gathers natural gas in the Texas Panhandle field and owns and operates a main natural-gas transmission line from that field to a point near Clayton, N. M., where connection is made with the facilities of Colorado Interstate and Clayton Gas Co. The rates received by FPC for filing apply only to the sale of natural gas to the Clayton company.

The schedules received from Colorado Interstate cover natural gas sold to the following distributors: Public Service Co. of Colorado, The Pueblo Gas & Fuel Co., Colorado-Wyoming Gas Co., Citizens Utilities Co., City of Colorado Springs, and Natural Gas Pipeline Co. of America. Colorado Interstate's main transmission line extends from a point near Clayton to Denver. It purchases its gas supply from Canadian River.

Campaign for Gas Export To Mexico Gets Started

WESLACO, Tex.—Resolutions have been adopted by the Hidalgo County commissioners and by the Valley Mayors association in favor of the application of La Gloria Corp. for permission of Federal Power Commission to export natural gas from Rio Grande Valley into Mexico. At La Gloria offices here it was said that chambers of commerce and city boards would be invited to take part in the campaign to gain support for gas exportation into Mexico. An earlier application submitted to FPC was denied.

Cities Service to Extend Lines in Two States

WASHINGTON.—Cities Service Gas Co., Oklahoma City, has been authorized by Federal Power Commission to construct and operate (1) 48 miles of 16-in. natural-gas pipe line from the company's present facilities in the Burbank field, near Shidler, Okla., to the Caney compressor station in Montgomery County, Kansas; (2) 6.4 miles of 16-in. line interconnecting the company's Altoona and Vilas lines in Wilson County, Kansas; and (3) additional minor facilities at the company's Grabham compressor station, Montgomery County, Kansas, and at the company's Petrolia compressor station, Allen County, Kansas.

The new facilities, estimated to cost $1,204,478, will enable the company to increase its over-all system deliveries by 11,922,708,000 cu. ft. per year. All of the additional gas will be delivered to existing customers. The FPC order provides that no new customers shall be served by means of these facilities except upon specific authorization of the commission.

Of the additional annual deliveries, it is estimated that 8,772,811,000 cu. ft. will be sold to Kansas City Gas Co. for resale to Kansas City Power & Light Co., the electric utility serving Kansas City, and 1,542,128,000 will be sold directly by Cities Service to the Jayhawk Ordnance Works.

FPC and I. N. G. A. Study Natural-Gas Investigation

WASHINGTON.—Representatives of Independent Natural Gas Association of America, accompanied by men well known in the oil industry, held a conference July 6 with Federal Power Commission for study of matters connected with the commission's investigation into the natural-gas industry. The conference had been asked by E. Buddrus, president of I. N. G. A.

The principal subject of discussion was the outline of procedure and topics to be covered in the investigation, which was issued on June 20. During the conference, general understandings were reached regarding presentation by the natural gas and oil interests of testimony at the FPC hearings scheduled to begin September 18 in Kansas City.

Attending the conference were Chairman Basil Manly and Vice Chairman Leland Olds, of FPC; Commissioner Nelson Lee Smith; Buddrus, W. E. Disney, John A. Ferguson, W. H. Wildes, and Joseph Bowes, representing the I. N. G. A.; J. C. Hunter, Interstate Oil Compact Commission; W. R. Boyd, Petroleum Industry War Council and American Petroleum Institute, and Russell Brown, Independent Petroleum Association.

Metropolitan Eastern Plans Texas-to-Ohio Pipe Line

WASHINGTON.—A hearing will be held October 15 by Federal Power Commission on the application of Metropolitan Eastern Corp. for authority to construct and operate 825 miles of 18-in. natural-gas pipe line extending northeasterly from the Carthage field, Panola County, Texas, to a point near Hamilton, Ohio.

The line, with appurtenant facilities, including five compressor stations having an aggregate of 25,600 hp. and a dehydration plant, is estimated to cost $23,500,000.

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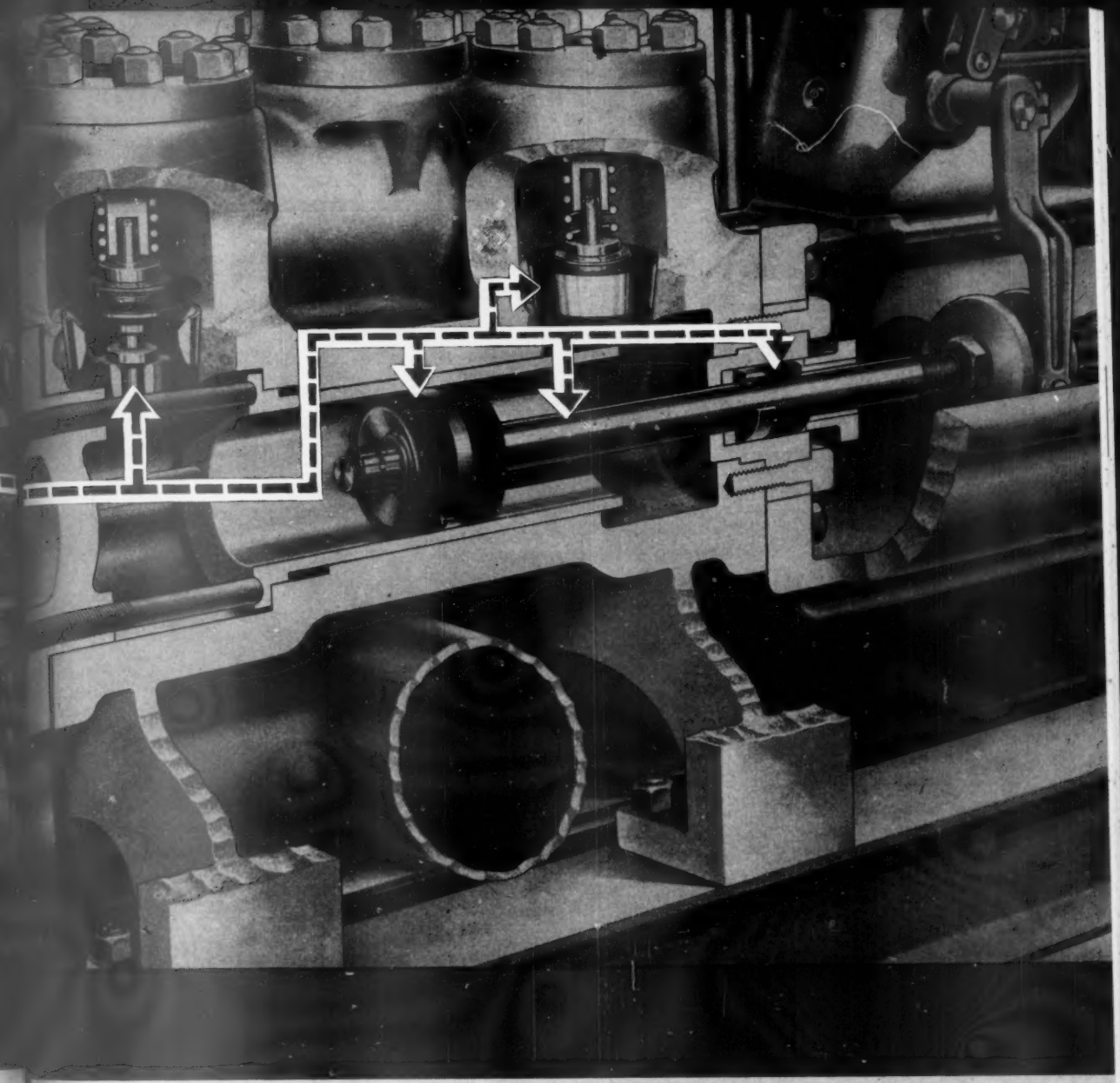

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PIPE LINES

China Plans 900-Mile Yumen-Kwangyuen Line

Plans and other arrangements have been completed, according to reports, by the China National Resources Committee for a 900-mile products line from the Yumen field in northwestern Kansu to Kwangyuen, a port on the Kialing River in northern Szechwan, 200 miles north of Chungking, China. Construction is to be carried on in the next 18 months.

The Yumen field is estimated to have capacity for producing 21,000 bbl. daily of crude oil from present wells. A drilling program is in progress. The line has been designed to transport 1,200 bbl. daily of high-octane gasoline, standard grade gasoline, kerosene and light fuel oils for military and industrial fields in southeastern China. By the end of this year it is expected that a 1,500-bbl. thermal cracking unit will be completed to replace equipment now in operation at Yumen. From the river terminal products are to be barged by river to Chungking until further pipe-line facilities are built later for making deliveries at several points.

Pipe Is Arriving for Utah's Rangely Line

Pipe is arriving and welding will start this week for Utah Refining Co.'s 149-mile 10-in. crude-oil line from the Rangely pool, Colorado to Wamsutter station, Wyoming.

Early this week 10 miles had been laid for the 25-mile 8-in. looping project between Uintah Junction and the Utah company's Salt Lake City refinery. This job will be completed within 2 weeks.

Texas-New Mexico Builds Tanks

Installation of facilities has been in progress for the trunk line from West Texas to the Gulf Coast of Texas-New Mexico Pipe Line Co. to provide for batching of sweet crude from the Permian basin. Additional storage also will be erected.

The company has been building four storage tanks at its Ozona pump station, three at the Junction pump station and two at the Rosanky pump station, near Smithville, in Bastrop County, each of 80,000-bbl. capacity. A pumping unit has been added to the Rosanky station.

Thirty-two miles of loops have been laid, one out of the Ozona station to the Todd deep pool and one out of the Crane station, and it is installing superchargers on all engines at its pump stations.

Sinclair's Lost Soldier System Is in Operation

Sinclair Refining Co. has recently put in operation the 36½ miles of 8-in. from Big Sand Draw to Crook's Gap which completes the 60-mile 8-in. line started last fall. The Crook's Gap-Lost Soldier section was put in operation in February after pipe had been laid temporarily on top of the ground. Some work remains to be done in the construction of tankage.

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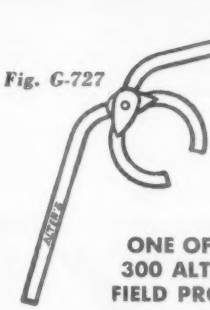

Fig. G-727

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PIPE-LINE PERSONALITIES

HARRY B. BRITTON, general superintendent, Plantation Pipe Line Co., was born in Ewing, Ill., November 8, 1895. After completing grade and high school education at Sesser, Ill., he was a student at University of Illinois. In addition to his studies for his civil-engineering degree, he had several elective courses in mechanical engineering, psychology, and the history of religions. The latter were valuable in preparing him for programs of improving industrial relations which became important in his later career.

His college work was interrupted by serving in the Navy where he was engaged in surveying and numerous construction activities at Great Lakes, Ill.

Throughout his college course he earned money for all expenses by odd jobs and by staying out a year, doing surveying and engineering work in the Illinois coal fields. Shortly after graduation in 1924 he was with a consulting firm engaged in work on sewers, reclamation and the underpinning of buildings.

In 1925 he joined the Shell organization with which he remained 16 years until he was assigned to responsibilities in the Plantation Pipe Line. At first he was a field engineer on refinery construction at Wood River, Ill., where he rose later to become assistant chief engineer in charge of all maintenance and utilities including power plants. During depression years of the early 1930's he was transferred to studies

of cost control, betterment, budgeting, etc.

Later he was chief engineer of the Shell refinery at Norco, La. In 1935 he was chief engineer of the East Chicago, Ind., refinery and in 1939 he assisted in conversion of these facilities to a terminal. In early 1940 he was transferred to the company's New York transportation office.

In 1941 Britton was loaned by Shell to Plantation Pipe Line Co. for design and engineering work, serving first as chief engineer and later as general superintendent.

Stanolind's Wind River Work to Start in August

Specifications will be issued by Stanolind Pipe Line Co. before July 15 for an undertaking known as the Wind River project in Wyoming which will include the laying of 68 miles of 8-in., 5 miles of 4-in., and 22 miles of 6-in. line. It is believed that all of the work will be handled in one contract.

Pipe for the 6-in. job will be furnished from the company's stock and deliveries will be made according to a schedule which will enable this part of the construction to commence early in August. The principal feature of the program is the laying of an 8-in. line from Steamboat to Lysite, Wyo.

ROCKY MTN. AREA MAP

New Map Designated "Pipe Lines And Official Oil And Gas Fields Of The Rocky Mtn. Area."

Map covers the entire States of Montana, Wyoming, Utah and Colorado.

Shows: Crude Oil, Gasoline and Natural Gas Pipe Lines with line sizes—Oil Fields in green, Gas Fields in red with official field names. State indexes at bottom of map giving official field names with locations of fields by township and range.

Size: 56" wide by 78" high, scale 1" = 12 miles.

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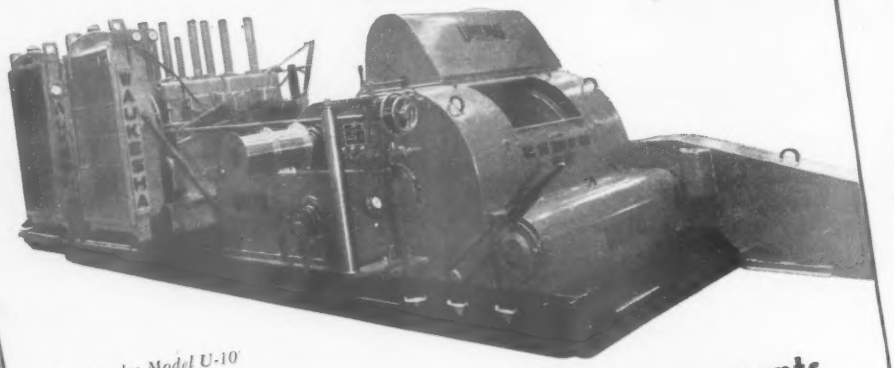

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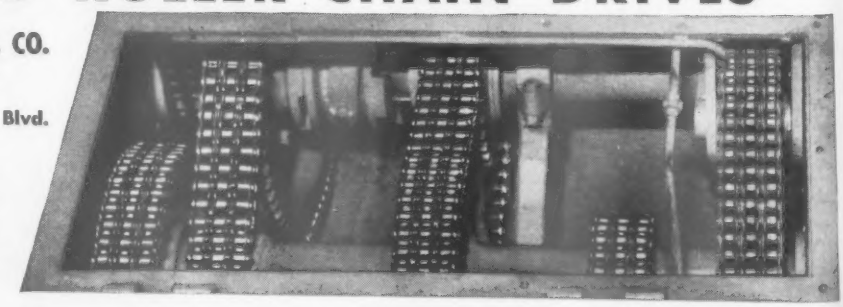


Exploration and Drilling

Week's Highlights

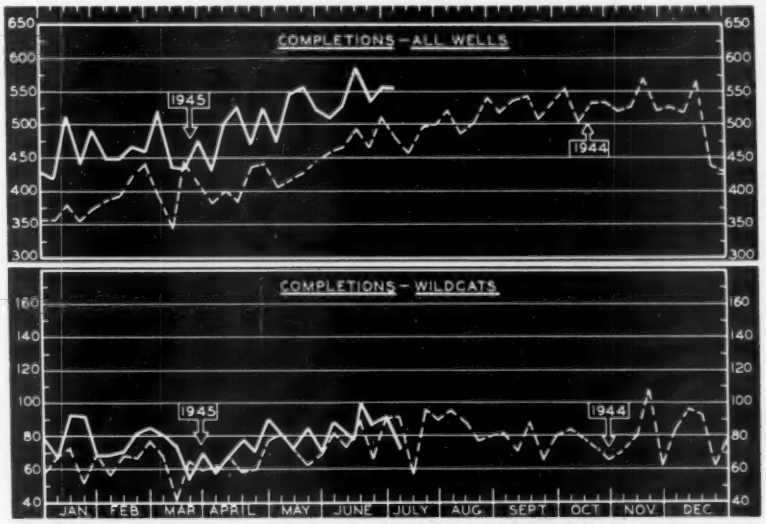
SUMMER is always the period of peak drilling activity in the Rocky Mountain region, but this summer and fall will see the highest peak in many years, as a result of the shift of war activity to the Pacific. After California, the Rockies offers the nearest source of supply.

Thanks to a highly successful exploration campaign in recent years, there is a substantial supply of low gravity, black oil available from the Embar-Tensleep fields now under development. This crude is an excellent base for fuel oil.

Development in this region is always tied closely with pipe-line outlets, and while these have been expanded, the probable war demands will call for additional lines. The PAW production quota for July is 155,600 bbl., an increase of 5,200 bbl. over June, and is the maximum the existing wells should produce. Further increases in quota are desirable to meet military demands, and will be forthcoming if additional development increases productive capacity.

While the Elk Basin-Casper pipe line has given outlets to Elk Basin, Gebo, Little Buffalo Basin and other fields, Fourbear, Half Moon, Spring Creek and Pitchfork need an outlet, and a 30-mile 10-in. line with 10 miles of 8-in. laterals, giving an outlet to Cody, Wyo., is reported ready for construction. Development activity will probably pick up in advance of the line's completion.

Another line reported ready for construction is to connect the Fre-



Solid line charts current weekly completions, service wells in Eastern area included

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JULY 7, 1945

	Total of all wells					Cum. to date		Wildcat completions and discoveries					Cumulative total, 1945				
	Comp.	Oil	Gas	Dry	Footage	1945	1944	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	34	17	0	*17	45,900	683	808	0	0	0	0	0	0	0	0	0	0
Pennsylvania	94	46	11	†37	134,100	1,970	1,904	0	0	0	0	0	0	0	0	0	0
West Virginia	8	1	6	1	24,353	401	431	0	0	0	0	0	0	0	0	0	0
Ohio	15	4	6	5	42,879	447	479	0	0	0	0	0	0	0	9	34	43
Indiana	6	2	0	4	10,939	95	106	1	0	0	0	1	4	0	0	14	18
Kentucky	12	6	2	4	26,586	232	344	1	0	0	0	1	15	0	2	22	39
Illinois	33	18	0	15	83,264	836	877	0	0	0	7	7	21	0	0	147	168
Michigan	7	3	0	4	16,450	382	315	0	0	0	0	0	5	0	2	125	132
Kansas	39	21	0	‡18	122,642	845	904	2	0	0	8	10	21	0	9	182	212
Neb., Mo., Iowa	0	0	0	0	0	12	16	0	0	0	0	0	0	0	0	9	9
Oklahoma	60	23	20	§17	225,832	1,249	845	1	0	1	8	10	49	1	8	180	238
Texas	152	79	19	54	649,815	3,706	2,714	5	1	1	19	26	118	7	29	668	822
North Central	45	14	0	31	103,675	1,092	716	1	0	0	6	7	43	0	5	242	290
West	39	29	3	7	150,947	973	778	0	1	0	3	4	31	1	0	143	175
Panhandle	12	4	7	1	38,824	281	100	0	0	0	0	0	0	0	1	4	5
Eastern	11	2	3	6	69,158	168	175	0	0	0	5	5	5	3	0	49	57
Gulf Coast	34	23	4	7	236,727	849	560	2	0	1	5	8	28	2	17	141	188
Southwest	11	7	2	2	51,484	343	385	2	0	0	0	2	11	1	6	89	107
Louisiana	15	6	3	6	86,415	516	384	0	0	0	3	3	16	2	4	66	88
Northern	10	3	3	4	36,160	184	147	0	0	0	2	2	3	1	4	37	45
Southern	5	3	0	2	50,255	332	237	0	0	0	1	1	13	1	0	29	43
Arkansas	6	3	0	3	29,963	90	107	0	0	0	1	1	0	0	0	25	25
Mississippi	10	4	0	6	67,921	183	59	0	0	0	6	6	3	0	0	61	64
Southeastern States	1	1	0	0	11,597	28	17	0	0	0	0	0	0	0	1	18	19
Montana	6	6	0	0	14,273	159	158	0	0	0	0	0	7	0	0	10	17
Wyoming	4	3	0	1	19,044	95	82	1	0	0	1	2	9	0	0	18	27
Colorado-Utah	1	1	0	0	6,755	18	15	0	0	0	0	0	1	0	0	3	4
New Mexico	8	6	0	2	22,938	230	206	1	0	0	1	2	8	0	2	31	41
California	41	37	0	4	158,288	1,185	1,002	0	0	0	2	2	1	0	2	110	113
Total United States	552	287	67	198	1,799,954	13,362	11,773	12	1	2	56	71	278	10	68	1,723	2,079
Total previous week	558	289	51	218	1,887,799	12,810	11,245	7	0	4	80	91	266	9	66	1,667	2,008
Total July 8, 1944	485	259	37	189	1,582,940	11,773	8,383	11	0	1	80	92	207	17	65	1,577	1,866

Service wells included: *17, †35, ‡1, §1.

mont County, Wyoming, fields of Circle Ridge, Maverick Springs, Winkelman dome, Steamboat Butte and Pilot Butte with the Elk Basin-Casper line, with a lateral to Riverton, joining the Husky Refining Co. Here again development activity will probably precede the line's completion.

The Rangely field, potentially the largest ever found in Colorado, last week had a substantial extension. It will soon have a pipe line outlet to Wamsutter, Wyoming, which should encourage faster development.

PAW's order last week prohibiting eastward shipment of crude, residual fuel oil and asphalt from the Rocky Mountain area serves to emphasize the size of the task, and makes it certain that every assistance will be given to insure the success of a substantial drilling program this summer and fall.

CALIFORNIA

New Deep Sand Looms for Cymric Field, Kern County

LOS ANGELES.—Based on results of a short formation test, Union Oil Co. seems to have discovered a new deep sand, probably Miocene in age, in the Cymric field, Kern County. During a short test, the well flowed at a daily rate of 800 bbl. of 30° gravity oil and 500,000 cu. ft. gas from a 100-ft. sand zone at 3,610 ft. Tester has been pulled and well will be completed.

Williams Brothers Oil Co. has set 7-in. pipe at 805 ft. in its wildcat southwest of the Antelope Hills field of Kern County, and is installing pumping equipment. The well bailed clean 19° gravity oil. The sand is a silty member of the Miocene and the area may be small, since the test is only a few hundred feet from a Continental Oil Co. dry hole and less than a mile from two other dry holes, one to the northwest and one to the northeast.

CALIFORNIA WILDCAT FAILURES

Kern County, Stockdale: Western Gulf 2-A Stockdale, 33-29s-27e, bottomed in gray sand, base Macoma 4,245 ft. dry, TD 5,326 ft.

Orange County, Kraemer: Richfield 1 Mohawk-Kraemer, 36-3s-9w, dry, TD 4,208 ft.

APPALACHIAN FIELD

2 Good Gas Wells For Wyoming County

PITTSBURGH.—In Baileyville district, Wyoming County, West Virginia, United Producing Co. completed two good gas wells on W. M. Ritter Lumber Co. The No. 1,171 gaged 1,565,000 cu. ft. after shot in the Berea gas 3,285-93 ft., shot 3,284-99 ft., rock pressure 540 lb., total depth 3,299 ft. The No. 1,252 had an open flow of 1,810,000 cu. ft. after shot in the Salt sand 1,422-66 ft, shot 1,436-52 ft., and in the Maxton 1,860 ft., shot 1,940-50 ft., total depth 2,159 ft.

During the week, 18 new locations were announced in West Virginia, widely scattered over the state in Barbour, Brooke, Cabell, Calhoun, Clay, Fayette, Harrison, Lewis, Logan, Nicholas, Ritchie, Tyler, Upshur, Wayne and Wetzel counties.

In Warren County, Pennsylvania, Northern Ordnance Co.'s test on the Reeves tract in Southwest Township is dry at 5,600 ft. The Oriskany sand was at 4,195-4,208 ft., Red Medina 5,370-5,534 ft, White Medina 5,557-75 ft.

New locations during the week totaled five of which three were in Armstrong County gas area, one in Fayette County and one in Washington County.

In Knox Township, Columbian County, southeast Ohio, Ohio Oil Co. topped the Oriskany sand at 3,943 ft. in test on J. F. Wafler Unit and drilling through the sand to bottom 3,525 ft., the highest natural volume was about 950,000 cu. ft. gas which often froze down. It was bottomed at 3,527 ft. and will be shot. The test appears slightly higher than either the discovery well on J. F. Barnett farm or the Richard Denny test. It is located about ⅝ mile southeast of the Barnett well.

SOUTHWEST TEXAS

De Witt County Gets New Condensate Pool

CORPUS CHRISTI.—A new gas-condensate pool for De Witt County, 2½ miles south of Yoakum, has been opened by Pure Oil Co. at 1 Eugene Rice in the James May Survey. The volume of gas was estimated at 84,000,000 cu. ft. per day, open flow. On a test through a ⅛-in. choke it flowed 26 bbl. per day of condensate, gravity 52.2°, with tubing pressure 2,610 lb., and casing pressure 2,790 lb. Perforations are around 8,160-90 ft. This well is now shut in.

A new producing sand in the Bruni field, Webb County, has been opened by Tom Graham and Lucey Petroleum Co. at the 1 Cole Petroleum Co. The new sand was perforated with 24 holes at 2,807-12 ft. and flowed 102 bbl. per day through 9/64-in. and 5/32-in. chokes, tubing pressure 40 lb., casing pressure 660 lb., no water, gravity 38°, gas-oil ratio 200 to 1. Total depth is 3,515 ft. with 5½-in. casing set at 3,006 ft. Three new locations have been staked in this area by Graham and Lucey Petroleum 1-M A. M. Bruni, approximately 850 ft. south of the 1 Cole Petroleum Co., 1 Tom Graham, approximately 880 ft. southwest, and 1 Josefina Vela de Pena, approximately 1,500 ft. west.

In the recently opened Willmann field of San Patricio County, Bridwell Oil Co. completed 2 Hertha C. Willmann, flowing 128 bbl. through 5/32-in. choke, no water, tubing pressure 350 lb., casing pressure 600 lb., gravity 23°, gas-oil ratio 217 to 1. Drilled to a total depth of 4,555 ft., perforations were made at 4,546-50 ft.

W. D. Kennard 1 D. R. Semmes, a wildcat located 5,400 ft. southeast of production in the Ross field, Starr County, flowed 72 bbl. of 26° gravity oil through a ¼-in. choke, no water. Tubing pressure 10 lb., through 76 perforations at 2,399-2,420 ft. Total depth is 2,435 ft. with 5½-in. casing set on bottom.

F. A. Callery 1 Ruth D. Davis, a wildcat, 4 miles southwest of Poteet, in the Jose A. Navarro Survey, Atascosa County, was abandoned at total depth of 5,367 ft.

Of the 32 locations reported this week 9 are wildcats with 5 of these being in McMullen County, and one each in Jim Hogg, Karnes, Nueces and Webb counties. Bruni field led with three new locations reported. Of the 28 completions this week only four were wildcats, two producers and two dry. Willamar field led with three completions, with Seeligson and Scott and Hopper fields next with two completions each.

SOUTHWEST TEXAS SUCCESSFUL WILDCAT COMPLETIONS

Starr County: New oil pool—W. D. Kennard 1 D. R. Semmes, Porcion 88, 5,400 ft. southeast of Ross field production, 10 miles northeast of Rio Grande City. Top sand 2,399 ft., TD 2,435 ft., perf. 76 holes 2,399-2,420 ft., PT 71 bbl. 26° gravity oil through ¼-in. choke, gas-oil ratio 250 to 1.

Webb County: New oil pay, Bruni field—

DAILY AVERAGE PRODUCTION FOR WEEK

	July 7 crude oil	Distillate, allied products	July PAW quota all oils	June 30 crude oil
Alabama	750	.....	500	700
Arkansas	80,000	5,000	85,000	80,100
California	940,750	60,900	1,012,900	942,900
Colorado	12,450	.....	12,000	11,000
Eastern	66,100	6,400	70,600	65,800
Florida	250	.....	.....	.....
Illinois	208,800	12,000	212,000	213,500
Indiana	11,300	.....	13,000	12,800
Kansas	242,300	4,100	278,100	273,250
Kentucky	29,800	2,200	30,200	30,500
Louisiana	366,650	42,500	402,500	368,150
North Louisiana	69,750	.....	.....	69,200
South Louisiana	296,900	.....	.....	298,950
Michigan	49,100	700	47,700	48,900
Mississippi	52,050	.....	53,000	51,200
Montana	23,750	300	22,300	23,050
Nebraska	900	.....	1,000	900
New Mexico	103,050	5,000	110,000	104,250
Oklahoma	388,750	28,000	408,000	388,400
Texas	2,209,400	163,000	2,333,000	2,180,450
East Texas	379,500	.....	.....	377,600
East Central Texas	139,000	.....	.....	139,900
North Central Texas	152,300	.....	.....	154,650
Texas Panhandle	87,500	.....	.....	90,000
West Texas	521,400	.....	.....	497,550
Southwest Texas	360,750	.....	.....	357,700
Texas Gulf Coast	568,950	.....	.....	563,050
Wyoming	104,350	3,100	121,300	102,800
Total United States	4,890,500	333,200	5,213,100	4,898,650
Change from previous week	down 8,150			

Total production January 1-July 7, 1945 ..... 902,397,350 bbl.
Same period last year ..... 841,688,251 bbl.

Tom Graham and Lucey Petroleum Co. 1 Cole Petroleum Co., M. Arispe Grant, Bruni Townsite, Lot 1, Block 5, top sand 2,800 ft., TD 3,515 ft., perf. 24 holes 2,807-12 ft., PT 102 bbl. 37.8° gravity oil through 9/64-in. and 5/32-in. chokes, gas-oil ratio 200 to 1, tubing pressure 40 lb., casing pressure 660 lb.

SOUTHWEST TEXAS WILDCAT FAILURES COMPLETED

Jim Wells County: Fidelity Oil & Royalty Co. 1 Alex A. Sharp, El Paisano Sur., 6 miles northeast of Falfurrias, dry, TD 8,600 ft.

San Patricio County: H. M. Amsler 1 C. L. Flinn, First Subdivision of Taft Farm Lands, Lot 1, Block 3, 2 miles east of Taft, dry, TD 6,505 ft.

EASTERN TEXAS

New Condensate Find For Harrison County

DALLAS.—D. E. and R. J. Whelan 1 Peal, Bettie Humphreys Survey, 3 miles northwest of Harleton, Harrison County, has assured a new discovery at total depth of 7,862 ft. It flowed at the rate of 10,169,000 cu. ft. of gas in 4 hours with 124 bbl. of 58.9° gravity distillate in 24 hours. Tubing pressure was 1,798 lb. and casing pressure was 2,590 lb. Gas-oil ratio was 82,000 to 1.

Bobby Manziel 1 Shamburger, J. Stark Survey, extended the Merigale pool of northern Wood County 1,400 ft. to the southwest. On a 24-hour official test it flowed 320 bbl. of 30.1° gravity oil. Gas-oil ratio was 300 to 1. This makes it the best producer in the pool. Total depth is 4,944 ft.

Wadley & Hawkins 1 Cork, MEP&P Survey, wildcat northwest of Texarkana, Bowie County, is dry at 6,592 ft. after showing water. Travis Peak was topped at 4,492 ft. and the Smackover at 6,515 ft. Elevation was 351 ft. Lone Star Production Co. and Shell Oil Co., Inc. 1 Tandy, W. Martin Survey in the Buffalo Woodbine area, Leon County, was drilling below 10,397 ft. in sandy shale with lime streaks.

Sinclair Prairie Oil Co. 1 Shofner, Dickerson Survey, 13,000-ft. test in the Chapel Hill field of eastern Smith County, was drilling below 10,441 ft. in sandy shale with no shows reported. Phillips Petroleum Co. 1 Hairston-Johnson, J. Hope Survey, 2 miles northeast of Gresham in the South Tyler field, Smith County, was drilling below 9,975 ft. with no further shows reported.

The Carthage field, Panola County, led this district with three completions this week. It also had the majority of new locations, having four.

EASTERN TEXAS WILDCAT FAILURES

Limestone County: Walter H. Gant (formerly C. W. Killough) 1 John Richardson, W. N. Miller Sur., 1½ mi. N Horn Hill, elev. 631 ft., Rodessa 4,852 ft., Pettit 5,225 ft., Travis Peak 5,362 ft., dry, TD 5,569 ft.

Navarro County: J. B. Daniel 1 Milligan, Martin Latham Sur., 3 mi. E Richland, elev. 372 ft., Austin chalk 2,360 ft., Eagle Ford 2,940 ft., dry, TD 3,207 ft.

Panola County: Skelly 1 Tompkins Unit, Chris Barbee Sur., 5½ mi. SW Beckville, elev. 359 ft., Pettit 6,340 ft., Travis Peak 6,698 ft., dry, TD 7,189 ft.

Shelby County: Hunt Oil 1 G. F. Bright, John English Sur., 4 mi. S and 10 mi. E Center, elev. 253 ft., James 5,762 ft., Pettit 6,080 ft., Travis Peak 6,882 ft., dry, TD 7,107 ft.

Upshur County: Mudge Oil 1 W. A. Hewitt, Wm. Carlton Sur., 5 mi. E Big

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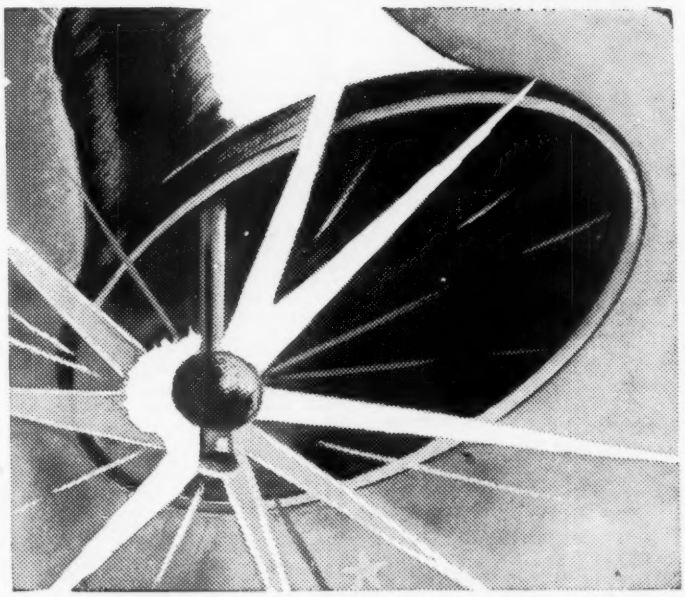
OIL LOANS



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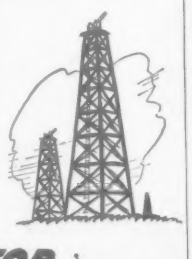


LUFKIN FOR ACCURACY

Sandy, elev. 366 ft., Massive anhydrite 6,913 ft., Pettit 7,867 ft., Travis Peak 8,012 ft., dry, TD 8,035 ft.

TEXAS GULF COAST

New Condensate Discovery For Harris County

HOUSTON.—A new gas-condensate pool for Harris County, 4 miles southeast of Cypress and approximately 1½ miles north of the Joyce Richardson pool, has been opened by Lenoir M. Josey, Inc. at 1-A fee. This discovery is located in HT&C Survey, Section 17, and was reported flowing at the rate of 40,000,000 cu. ft. of gas, along with 25 to 30 bbl. of condensate per million feet of gas through a ¼-in. choke with 2,550 lb. pressure. Production is from 40 perforations at 6,955-65 ft. Total depth 7,550 ft. with 5½-in. casing set at 7,380 ft.

K. B. Knox Drilling Co. 1 J. W. Wood, discovery well in Wm. Weir Survey, 4 miles northwest of Willis, in Montgomery County, was reported shut in after running tests in the 12 perforations at 3,757-60 ft. where it flowed at the rate of 45 bbl. daily on ¼-in. choke, tubing pressure 175 lb., casing pressure 465 lb., gravity 37°. Two-inch tubing set at 3,737 ft. Total depth is 3,762 ft.

A new sand in the Silsbee field of Hardin County has been opened by American Republics and Houston Oil Co. of Texas 33 Brooks-fee. It flowed 162 bbl. per day through a 5/32-in. choke from perforations at 7,510-18 ft., tubing pressure 1,325 lb., casing pressure 1,950 lb., gas-oil ratio 2,913 to 1, gravity 41°, 0.2 per cent water. Drilled to 8,155 ft., operators plugged back to 7,525 ft. for completion. Top of sand is 7,500 ft.

An extension test at Chesterville field, Colorado County, Stanolind Oil & Gas Co. 1 E. A. Wiese, was completed through perforations at 6,058-70 ft., with a calculated open flow potential of 19,000,0000 cu. ft. of gas. It flowed 26 bbl. of condensate daily through a 10/64-in. choke, gas-oil ratio 74,675 to 1, gravity 51°, tubing pressure 1,990 lb., casing pressure 2,160 lb. Total depth is 9,680 ft.

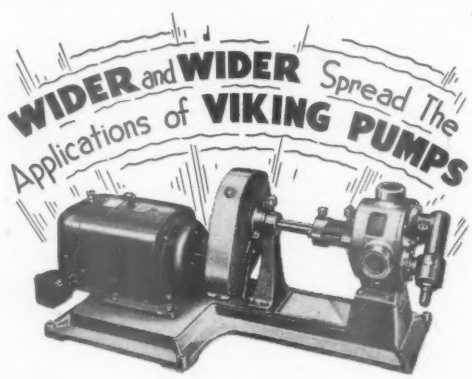
Of the 15 new locations reported this week 3 are wildcats, 1 each in Lee, San Jacinto, and Wharton counties. North Withers field in Wharton County led with four locations. Of the 17 completions this week, 6 were exploratory resulting in 1 oil pool discovery in Harris County, 1 new oil pay in Hardin County, 1 gas-condensate extension in Colorado County, and 3 dry holes.

UPPER GULF COAST SUCCESSFUL WILDCAT COMPLETIONS

Colorado County: Extension to Chesterville field—Stanolind Oil & Gas Co. 1 E. A. Wiese, GH&H Sur., ¾ mile southeast of Magnolia Pet. Co. 1 Anderson, discovery well, TD 9,680 ft., perf. 72 holes, 6,058-70 ft., PT 26 bbl. 51.5° gravity condensate per day through 10/64-in. choke, gas-oil ratio 74,675 to 1. Calculated open flow 19,000,000 cu. ft. gas daily. Tubing pressure 1,900 lb., casing pressure 2,160 lb.

Hardin County: New oil pay, Silsbee pool—American Republics and Houston Oil Co. of Texas 33 Brooks-fee, G. W. Brooks League, TD 8,155 ft., top sand 7,500 ft., perf. 7,510-18 ft., PT 162 bbl. 41.2° gravity oil, 0.2 per cent water, through 5/32-in. choke, gas-oil ratio 2,913 to 1, tubing pressure 1,325 lb., casing pressure 1,950 lb.

Harris County: New oil pool discovery, Hockley field—Magnolia Petroleum Co. 2 Warren Ranch, Joshua Hudson



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Sur., 5 miles south of Hockley, TD 6,366 ft., top sand 6,356 ft., PT 204 bbl. 32.4° gravity oil through 9/64-in. choke, gas-oil ratio 406 to 1, tubing pressure 550 lb.

UPPER GULF COAST WILDCAT FAILURES COMPLETED

Fayette County: John A. Deering and E. V. Abernathy 1 Susanna Haynie, Thos. Cochran Sur., 5 miles southeast of Smithville, dry, TD 1,498 ft.

Orange County: Atlantic Refining Co. 1 Miller-Vidor Land Co., Thos. H. Breece Sur., dry, TD 9,124 ft.

Washington County: Phillips Petroleum Co. 1 Mrs. H. Priesmeyer, S. M. Williamson Sur., 6½ miles southwest of Brenham, dry, TD 6,794 ft.

PERMIAN BASIN

3 Crane Co. Wildcats Take Drill-Stem Tests

MIDLAND.—Humble Oil & Refining Co. 1 G. H. Cowden, a wildcat 1 mile northwest of the shallow Crane-Cowden pool of southeastern Crane County, took a 1-hour drill-stem test in the Devonian from 6,080-6,150 ft. There was gas to the surface in 6 minutes, estimated at 450,000 cu. ft. daily. Recovery was 5,200 ft. of fluid, 30 per cent being 41.2° gravity oil and 70 per cent water. It was drilling below 6,193 ft. in lime and chert. Magnolia Petroleum Co. 1-B H. H. Tucker, a wildcat in southwestern Crane, 3 miles west of the McKee pool, on a 90-minute drill-stem test in the lower Permian from 4,183-4,223 ft., recovered 600 ft. of oil and gas-cut drilling mud. It was drilling past 4,264 ft. in hard lime. Atlantic Refining Co. 1-A University, a wildcat 6 miles west of the McElroy pool in eastern Crane, was taking a drill-stem test from 8,810-8,900 ft., total depth, in the lower Devonian.

Stanolind Oil & Gas Co. 1 J. F. Edwards, San Andres discovery in southwestern Cochran County, 11½ miles west of the Rhodes pool, after being shut in approximately 24 hours, was opened and flowed 158 bbl. of oil and 10 bbl. of basic sediment in 8 hours through open 2-in. tubing. It averaged 15 bbl. of oil per hour for the last 5 hours, flowing by heads. Casing pressure was 120 lb. to zero. Operator has recommended that the well be acidized. It was plugged back to 5,080 ft. from total depth of 5,111 ft.

Andrews County.—Magnolia and Humble 1 E. P. Cowden, wildcat in the southwestern corner of the county, showed slight oil staining in samples from 7,439-65 ft. A 70-minute drill-stem test was run from 7,433-65 ft. and 1,350 ft. of water cushion and 480 ft. of drilling mud was recovered. There were no shows. Operator was drilling ahead. On the last attempt to take a drill-stem test of Shell Oil Co. and The Texas Co. 1 Ratliff & Bedford, Ellenburger discovery in southwestern Andrews, packer failed in 8½ minutes. The test was from 11,097-117 ft. There was a steady blow of air throughout the test with gas in 8 minutes. Recovery was 450 ft. of oil, 550 ft. of heavily oil and gas-cut mud and 400 ft. of slightly oil and gas-cut mud. It was preparing to drill ahead.

Texas Pacific Coal & Oil Co. 1 Mrs. May Williams is the first completed producer in the new pool in northwestern Terry County where Fikes & Murchison drilled the discovery 1 Alexander. It was completed for 95.07 bbl. of 30.2° gravity oil from 5,120-45 ft. in the San Andres.

The Pecos Valley field in Pecos County led in completions this week with six, while the Slaughter pool, Cochran and Hockley counties, had five and the Fullerton pool, Andrews County, had three. Leading in new field locations were the TXL pool, Ector County, with 10, the Fullerton pool with six and the North Ward-Estes pool, Ward and Winkler counties, with three.

WEST TEXAS SUCCESSFUL WILDCAT

Concho County: New condensate field—Northern Ordnance 1 Mrs. Leta Sorrell, Sec. 206, Eliza Kempner Sur. A-1743, elv. 2,041 ft., IP 20,500,000 cu. ft. gas day with 51 bbl. dist. per million feet gas through open 2-in., perf. 3,295-3,304 ft. Pennsylvanian, TD 3,322 ft.

WEST TEXAS WILDCAT FAILURES

Glasscock County: Union of Calif. 1 Sally Edmondson, Sec. 210, Blk. 29, W&NW Sur., 4 mi. S Howard-Glasscock pool, elev. 2,549 ft., dry, TD 4,101 ft.

Tom Green County: Texas 1 Edwards, Sec. 58, Dist. 11, SP Sur., 10 mi. SE San Angelo, elev. 1,871 ft., Ellenburger 5,295 ft., Cambrian 5,905 ft., dry, TD 5,955 ft.

Val Verde County: Wilson & Hodges 1 fee, Sec. 57, Blk. E, GC&SF Sur., elev. 1,935 ft., dry, TD 430 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Neville G. Penrose, Inc. 1 Federal-fee has opened a new deep pool in southeastern Lea County. On a drill-stem test from 7,950-92 ft. there was gas to the surface in 2 minutes, mud in 12 minutes and oil began flowing in 15 minutes, with estimated flow of 15 bbl. of oil in 1 hour. The gas was estimated at 7,000,000 to 10,000,000 cu. ft. of gas daily. The discovery is 5 miles northwest of the Drinkard-Yeso discovery well and about 3 miles west of Gulf Oil Corp. 1 Paddock, recent Holt zone discovery.

Mid-Continent Petroleum Corp. 1 Christmas is the second producer from the Holt zone of the Permian lime in the

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HOUSTON U.S.A. TEXAS

north end of the Drinkard area. The well flowed 727 bbl. of 38° gravity oil in 12 hours through perforations from 5,165-85 ft. It was then shut in preparatory to completion. It is a ¼-mile outpost to Gulf 1 Paddock.

Eddy County had five completions, the majority for this district. Two of these were in the Russell field. Lea County had 5 new locations this week and Eddy County had three.

SOUTHEASTERN NEW MEXICO SUCCESSFUL WILDCAT

Lea County: New oil pool—Skelly 2 Johnson, 20-23s-37e, 1 mi. S 2 Steeler, elev. 3,326 ft., flowed 648 bbl. day through 30/64-in. choke on 2-in. tubing, perf. 3,585-3,676 ft. Grayburg, gravity 35.5°, TD 3,676 ft.

N. CENTRAL TEXAS

Wilbarger County Gets New Ellenburger Pool

WICHITA FALLS.—National Associated Petroleum Co. 1 Sam Kelly Estate has opened a new Ellenburger pool in Wilbarger County, 1 mile east of Harrold. The well flowed 274 bbl. of 42° gravity oil in 8 hours through open 2-in. tubing through perforations from 4,905-26 ft., total depth. The discovery also had good shows in the Canyon at 4,642-77 ft., Bend conglomerate at 4,564-80 ft., Caddo at 4,446-94 ft. and KMA at 4,074-90 ft.

Fain & McGaha 2 Prideaux, A. Rohus Survey, Strawn sand discovery 3 miles northwest of Markley in northeastern Young County, has been completed for 134 bbl. of 56° gravity oil in 8 hours through ½-in. tubing choke. Top of the pay is at 3,622 ft. in the Strawn. Total depth is 3,637 ft. Gas-oil ratio is 420 to 1.

Cooke County.—The Texas Co. 1 Buckley, wildcat 15 miles northeast of Gainesville, reperforated from 5,038-52 ft. On a 12-hour test it recovered 13 bbl. of 39.2° gravity oil and 12 bbl. of slightly brackish water. It was still swabbing and testing. Sun Oil Co. 1 Mabel Field, 1½-mile south outpost to the Sivells Bend pool, perforated with 84 shots in the 7-in. casing from 6,690-6,704 ft. and swabbed and flowed salt water, no oil. Operator squeezed with 100 sacks and is waiting on cement to set. Sinclair Prairie Oil Co. 2 Putnam, Ward Survey, joined the GNB Ellenburger pool of northeastern Cooke with the Walnut Bend pool to the northwest when it was completed on the pump for 85.5 bbl. of 29° gravity oil in 24 hours.

The counties leading in field completions this week were Throckmorton County with eight, Archer County with six and Jack and Cooke counties each with four. The fields leading in locations were the Vogtsberger field in Archer County with three and the Bowers field, Montague County, with two.

NORTH CENTRAL TEXAS SUCCESSFUL WILDCAT

Cooke County: New oil pool—Hollandsworth Drilling 1 W. A. Mathews, Robt. Ekey Sur. A-357, 3½ mi. SW Myra, elev. 885 ft., pumped 80 bbl. day, perf. 1,543-48 ft. Strawn, TD 1,548 ft.

NORTH CENTRAL TEXAS WILDCAT FAILURES

Archer County: W. H. Peckham 1 L. F. Wilson, Sec. 122, Lot 2, ATNCL Sur., 4 mi. N and 1 mi. W Archer City, elev. 960 ft., dry in Strawn, TD 4,690 ft.

Cottle County: S. D. Johnson 1 B. L. Smith, Sec. 34, Blk. N, T. A. Thompson Sur. A-833, 10 mi. NE Paducah, dry, TD 6,004 ft.

Jack County: L. T. Burns 1 M. M. Garrett, BBB&C Sur. A-100, 2 mi. W and ½ mi. N Antelope, dry, TD 750 ft.

Continental 1 Roy Cherryhomes, J. Irwin Sur. A-313, 6½ mi. SE Jacksboro, elev. 1,116 ft., Caddo 5,386 ft., Ellenburger 6,606 ft., dry, TD 6,728 ft.

Throckmorton County: Bridwell Oil 1 J. H. Lee, Sec. 2352, TE&L Sur., 5 mi. N and 3 mi. E Woodson, elev. 1,286 ft., dry, TD 2,075 ft.

WEST CENTRAL TEXAS

ABILENE.—Ted Weiner and Lico, Inc. 1 Turner et al, D&DAL Survey, prospective King sand pool opener in northeastern Jones County, was shot with 5 qt. nitroglycerin from 2,119-23 ft., and was cleaning out and testing. Bailey Balkan 1 Harris, ½-mile west extension to the Reddin pool in northern Taylor County, pumped 10 bbl. of oil in 24 hours through perforations from 2,623-25 ft. in the Gunsite.

Shackelford County led in field completions this week, having four, while Coleman County and Stephens County had two new field locations each.

WEST CENTRAL TEXAS WILDCAT FAILURE

Coleman County: C. P. Burton 1 C. J. Fine, N. B. Waters Sur. No. 697, 3 mi. S Silver Valley, elev. 1,966 ft., Morris 2,900 ft., Caddo 3,434 ft., dry, TD 3,514 ft.

OHIO, KENTUCKY

Muskingum Co. Has New Clinton Gas Prospect

COLUMBUS.—The South-Penn 1 H. M. Vernon, Section 19, Adams Township, Muskingum County, a wildcat 7 miles from the nearest Clinton gas, had 258,000 cu. ft. in pays at 4,181 and 4,195 ft. Clinton sand was found at 4,180-4,226 ft. and the Medina sand at 4,272-75 ft., dry. The well is to be shot and tested.

Ohio Oil 1 J. F. Wafler, Section 13, Knox Township, the fourth well to reach the Oriskany sand in the new Columbiana pool, gaged 840,000 cu. ft. with sand from 3,496-3,525 ft. The well is to be shot before completion.

INDIANA

EVANSVILLE.—Carter Oil Co. 1 A. S. Cox, extended the Mt. Vernon pool in Henderson County. Other completions in the state were dry or small producers.

INDIANA SUCCESSFUL WILDCAT

Posey County: Carter Oil 1 A. S. Cox, NW NW SE 14-7s-14w, Tar Springs sand 2,077-89 ft. TD, IP 84 bbl. of oil, 6 bbl. salt water. Extends Mt. Vernon pool.

WESTERN KENTUCKY

OWENSBORO.—Latest report from Ekirk Associates' wildcat test near Elkton, Todd County, had it testing after Devonian lime at 1,389-92 ft. had been acidized. It was said to be showing oil.

The Smith Mills pool in Henderson County was extended by a Sinclair Prairie outpost good for 150 bbl. initially.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Henderson County: Sinclair Prairie 3 Humphrey, 6-P-21, O'Hara (Levias) lime 2,552-64 ft. TD. Swabbed 150 bbl. in 24 hours. Extends Smith Mills pool.

EASTERN KENTUCKY

ASHLAND.—Floyd and Magoffin counties provided the center of activities during the week with one gas well netting

an open flow of nearly 1,225,000 cu. ft. of gas.

Inland Gas Corp. completed No. 276 on the J. H. Hammonds property, Bull Creek of Licking River in Magoffin County, at a total depth of 1,302 ft., with daily open flow of 1,212,000 cu. ft. of gas in the Maxon.

Kentucky-West Virginia Gas Co. completed No. 5,149 on the John Hall property in Floyd County at a total depth of 2,696 ft., with daily open flow of 253,000 cu. ft. of gas in shale after shot.

ROCKY MOUNTAIN

Operations Step Up to Meet Pacific War Demand

DENVER. — Operators in the Rocky Mountain area are making preparations to speed up production of crude, especially the black oils, during the last half of 1945 on a scale unprecedented in this territory. For July the PAW certified 155,600 bbl. per day for this area, an increase of 5,200 bbl. over June. The August figures have not been announced. It is believed there will be another increase either in August, or later in the year, depending upon the ability of the producers to raise their output. The July allotment calls for about all the crude that can be brought to the surface during that month. Further increases later in the year may be possible from a more extensive drilling campaign and the construction of pipe-line facilities. The increased demand in Region 4 is directly traceable to the acceleration of the war in the Pacific.

Pipe-line construction already has taken place on a considerable scale this year in anticipation of the increased demand. The principal project was the Elk Basin-Casper line of the Stanolind Pipe Line Co. which has opened marketing facilities for a number of fields in the Big Horn Basin. These include Elk Basin, Gebo, Little Buffalo Basin and others. The Sinclair interests constructed outlets for Big Sand Draw, Crook's Gap and other new fields in Fremont County. Other lines under way include the Rangely-Wamsutter project of Stanolind which will furnish marketing facilities for Rangely and Wilson Creek in Colorado. This oil can move either east or west to Salt Lake City or Chicago according to where it is most needed. Plans are under way for a connection with this line to run to a refinery at Pocatello, Idaho. Another project is a line in Fremont County to serve Circle Ridge, Maverick Springs, Winkelman Dome, Steamboat Butte, and Pilot Butte fields. This line will connect with the Elk Basin-Casper line and will have a lateral to Riverton where Husky Refining Co. is filling a large contract for the Navy. Still further expansion of facilities is expected to get under way shortly in a 10-in. 30-mile line, with 10 miles of 8-in. laterals to transport black oil from Fourbear, Half Moon, Spring Creek and Pitchfork to Cody. These fields, although not all of recent discovery, were shut in for a long time for lack of facilities until the demand for crude made the construction necessary. The full effect of all of this new construction will be manifested within a few months, and will mean that outlets have been provided for increased production for all of the more important fields, including those discovered within the past year.

Drilling operations.—New operations in District 4 are gaining steadily in anticipation of the increased demand for crude. There were 21 locations released the past week, of which 16 were for development wells and 5 were wildcats. This compares with a total of 13 for last week. Cut Bank had 8 new operations, Oregon Basin 2, Rangely 2, the others being scattered among the producing fields. One of these marked the entrance of Phillips Petroleum Co. into the Rangely development in its 1 Levison, C SE SE 27-2n-102w.

The wildcats include a location by Carter Oil Co. on the Milk River structure, Glacier County, Montana, in 1 Lucy Weaselhead, C SW NE 28-34n-12w, in the Blackfeet Indian reservation. Hageman, Pond & Hanlon is moving in for a Madison test on Shell Creek in 1 Herron, NE SE NE 31-53n-92w, Big Horn County, Wyoming, on the east side of the Big Horn Basin. Williams Brothers will drill Poison Creek, Crook County, Wyoming, on a farmout from Continental Oil Co. in 1 Unit, NW SE NE 15-54n-67w. Frontier Refining Co. has spotted its first Montana venture in the Devon District, Toole County, in 1 Christiana, NW NE NE 9-33n-1e. Phillips Petroleum Co. is building rig for a test in SE SW SW 15-27n-89w, Bailey District, Carbon County, Wyoming, northeast of the Sinclair discovery well in the Sundance.

South Elk Basin discovery tested.—Continental Oil Co. 1 Ida Goodstein, NE SE SW 20-57n-99w, a discovery in the Tensleep at South Elk Basin, 3 miles south of the Elk Basin field, is a completion at 7,166 ft., total depth. It pumped 594 bbl. per day of 29° gravity oil after unloading the head, the fluid level being approximately 1,800 ft. from the top and the working barrel set at 3,000 ft. This is the capacity of the pump and does not represent the total capacity of the well. The gas-oil ratio was 137 cu. ft. The operator is drilling a second well to the Tensleep ¼ mile south of the discovery, and a northwest offset which will go to the gas sand encountered in the Morrison.

Completions.—Completions for the week numbered 11, of which 10 were oil wells

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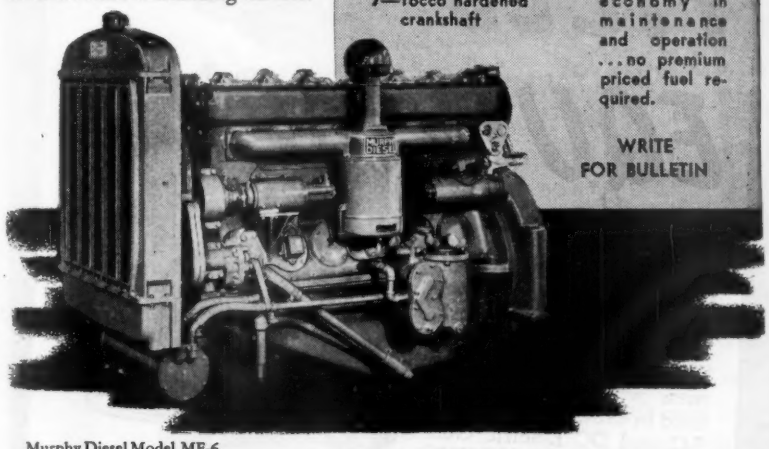

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and one was a dry hole. These were divided as follows: Colorado, 1; Wyoming, 4; Montana, 6. New production amounted to 1,748 bbl. Cut Bank and Kevin-Sunburst each had three producers. Others were one each in South Elk Basin, Oregon Basin, Garland, Wilson Creek, and one dry wildcat in Crook County, Wyoming.

WYOMING SUCCESSFUL WILDCAT COMPLETION

South Elk Basin, Park County: Continental Oil Co. 1 Ida Goodstein, NE SE SW 20-57n-99w, TD 7,166 ft., top Tensleep 6,971 ft., pumped 594 bbl. 29° gravity in 24 hours from Tensleep through perforations, gas in Frontier, Dakota and Morrison sands cased off.

WYOMING WILDCAT FAILURE COMPLETED

Hulett, Crook County: Williams Brothers 1 Government, NW NW SW 15-55n-67w, TD 3,380 ft., top of Madison 3,345 ft., water, dry in the Deadwood formation.

CANADIAN FIELDS

Alberta Wildcat Has Production in Madison

CHATHAM. — In southern Alberta, 6 miles south of the Steveville-Princess field, Empire Pacific 1, LSD 1, 27-19-12w4, failed to get the Sunburst sand but has encountered what is apparently commercial production in the top of the Madison limestone. At 3,284 ft. gas was struck above the lime, and in the lime capping at 3,309 ft., a drill-stem test showed 634 ft. of fluid, mostly oil, in the 4½-in. pipe. Coring continued to 3,323 ft. with increased showings, when it was decided to abandon plans for deepening to the Devonian and take the unexpected Madison production. A 2½-hour drill-stem test at 3,281-3,323 ft. showed 1,274 ft. rise, mostly 28-gravity oil, with 750,000 cu. ft. gas.

Conrad.—In the Conrad field, southern Alberta, Conrad-Province 31-32B, LSD 2, 32-5-15w4, is finishing a producer in the Ellis at 3,101 ft., oil rising 960 ft. in an hour in the 4½-in. pipe.

Turner Valley.—In North-Central Turner Valley, Royalite 80, LSD 10, 2-20-3w5, with Madison limestone at 7,480-7,793 ft., made 480 bbl. after acidizing with 4,000 gal.

In the old West-Central Turner Valley area, Miracle 3, LSD 11, 4-19-2w5, originally finished a naphtha producer from the lime at 5,490-6,150 ft., and is testing Home sand at 4,580 ft. which showed 3,600 ft. of light crude in the hole after a shot. Production around 65 bbl. daily is expected.

Okalta Oils 22 has been spotted in SE¼ LSD 8, 1-20-3w5, in the old Central Turner Valley gas cap area, as a definite shallow test of oil-bearing horizons above the Madison, including the grit beds and the McDougall-Segur, Home and Dalhousie sands. Location is close to the old Herron-Elder well, started in 1914, which got considerable light crude in the shallow horizons.

Calling Valley.—On the Calling Valley structure, northeast of Turner Valley, Calling Valley Syndicate 1, LSD 6, 24-21-3w5, bottoming in the Madison lime at 10,025 ft., and plugged back to 9,838 ft., was dry, as bailing tests showed water in the formation with a little oil.

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OKLAHOMA

Wildcat Showings Continue To Hold Most Interest

A NORTH extension to the West Edmond field was the most important completion in Oklahoma in the past week, but general field interest remained centered in important wildcat showings in other western and southwestern counties. The most interesting of these continued to be Cities Service Oil Co. 1 Lawson, C SW NW 22-5n-4w, in southwestern McClain County, which had good saturation in Wilcox sand at 10,800-903 ft. Casing was to have been run, and it is expected that definite results of the operation will soon be known. The well is regarded as the most important wildcat in the state at this time.

Over in Beckham County, on the western border of the state, A. R. Jordan 1 Caudell, C SE NW NW 35-9n-25w, 4 mi. south of the Erick gas field, had top of Granite Wash at 2,890 ft., and a showing of oil at 3,040-3,104 ft. A 30-minute drill stem test of the lower named zone resulted in 1,000 ft. of oil-cut mud. The crew was running pipe.

Tide Water Associated Oil Co. and Skelly Oil Co. 1 Baldwin, SE NE NE 10-9n-25w, Beckham County, which opened a deeper productive zone in the Erick gas field, indicated a potential production of 22,500,000 cu. ft. of gas per day with 2,500-lb. casing pressure. The well was drilled to Granite at 7,559 ft. and plugged back to, and is producing from, conglomerate lime and Granite Wash at 6,786-90 ft. Owners were making pipe connections to the well.

Gulf Oil Corp. 1 Triplett, C NE SW 8-15n-5w, Kingfisher County, a wildcat that held interest for some time, tested salt water and a show of gas and will

be abandoned as a dry hole. It had Hunton lime at 7,362 ft. and Sylvan Shale at 7,674-92 ft.

In the Ringwood area, Major County, Superior Oil Co. of California 1 Manning, NE NE NW 27-22-10w, reamed core hole to 8,089 ft. and was drilling ahead.

Sinclair Prairie Oil Co. 1 Hall, NW NW SE 36-7n-13w, Caddo County, topped Sycamore limestone at 4,790 ft. (estimated) and made a 1-hour drill stem test of formation at 5,175-5,221 ft. recovering 112 ft. of oil-cut mud and was drilling at 5,331 ft.

H. L. Hunt was drilling at 7,926 ft. after topping Mississippi lime at 7,225 ft., in 1 Clark, SE NE SW 32-22n-14w, Major County.

Ace Gutowsky 1 Zaludck, C NW SW 21-24n-6w, Garfield County, had second white and dry Wilcox sand at 6,657-61 ft., and was drilling ahead.

Anderson-Prichard Oil Co. extended production in the West Edmond field a half-mile north with 1 Wright, C SE SW 13-15n-5w, Kingfisher County, which flowed 260 bbl. in 6 hours through perforations at 6,970-98 ft., total depth 7,243 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Hughes County: New gas pay—Harry Davison Drilling 1 Wells, SE NE NW 29-9n-10w, South Wetumka, flowed 33,000 cu. ft. gas from Booch lime at 2,490-2,515 ft., TD 3,057 ft., Booch 2,500 ft., Gilcrease 2,794 ft.

Oklahoma County: Bethany pool discovery—Kerlyn 1 Classen, NW SE 22-12n-4w, flowed 404 bbl. condensate and 19,700,000 cu. ft. gas from Hunton at 7,154-7,200 ft., TD 7,952 ft., Hunton 7,154 ft., Harrington 7,220 ft., Chimney Hill 7,312 ft., Sylvan 7,457 ft., Viola 7,569 ft., Wilcox 7,797 ft., second Wilcox 7,916 ft.

OKLAHOMA WILDCAT FAILURES

Ellis County: Gulf 1 Kelln, NE NW NE 5-19n-26w, TD 8,886 ft., Pennsylvanian 5,040 ft.

Garvin County: W. A. Delaney et al 1 Brickman, SW SE NW 12-3n-2e, dry, TD 2,828 ft., McLish 2,764 ft.

Rockhill Sand & Gravel 1 Billman, SW SW SW 9-2n-3e, dry, TD 1,380 ft., will skid 75 ft. west to 1-A location.

Lincoln County: F. A. Gillespie & Sons 1 Freeman, NW NW NE 17-16n-5e, dry, TD 3,915 ft., Inola 3,803 ft.

Logan County: Phillips 1 Min, SE NW 26-18n-4w, dry, TD 4,883 ft., Layton 4,815 ft.

Fox & Fox 1 Ray, SW SE 28-17n-3w, dry, TD 4,910 ft., Layton 4,796 ft.

Payne County: J. E. Crosbie 1 Bryant, SE SE 6-18n-5e, dry, TD 3,689 ft., Woodford 3,525 ft.

Pottawatomie County: J. F. Smith et al 1 Atwater-Fundis, NW NE 19-7n-3e, dry, TD 5,386 ft., Wilcox 5,358 ft.

MICHIGAN

Clare County Wildcat Gages Million Feet Gas

SAGINAW.—Taggart Brothers Co. 1 Thompson, SE SE SE 13-18n-5w, a wildcat three miles north of the Hatton field in Clare County, gaged 1,000,000 cu. ft. of gas from the Stray sand at 1,628-48 ft. The outpost was started in 1943, but was carried only to 1,030 ft. Recently testing was made possible by a new program. The test will be carried to the Dundee.

Only seven completions were made this week, including three oilers, and four dry holes. No wildcats were completed.

Six of the ten drilling permits issued this week were for wildcat starts. Wildcat locations are planned for Allegan, Gratiot, Kent, Osceola, Van Buren, and Washtenaw counties.

ILLINOIS

Calhoun Pool in Richland County Is Extended

EIGHTEEN oil wells and 15 dry holes were reported completed in Illinois in the past week. Seven of the dry holes were wildcat tests. Initial production of the 18 producers averaged 120 bbl. per well, the largest being a 250-bbl. well, the smallest a 6-bbl. initial producer.

In the past week the Calhoun pool in Richland County was extended one location south by Phillips Petroleum Co. 3 Delilah, NW NW NE 7-2n-10e. The well swabbed 104 bbl. in 8 hours from McClosky lime at 3,148-56 ft., which had not been acidized.

A survey of the Illinois field made by the State Geological Survey for the month of June shows two pools opened, three new pays discovered in pools and two pools extended. The new pools are Seminary in Richland County, producing from McClosky lime and Shattuc in Clinton County, producing from Cypress sand. Extensions included Johnsonville Consolidated pool in Wayne County and the Kenner pool in Clay County. New pays are the McClosky lime in the Kenner pool Cypress sand in the Brownsville pool, White County and Rosiclaire lime in the Bible Grove pool in Effingham County. Five old wells were reworked for new production. Most active

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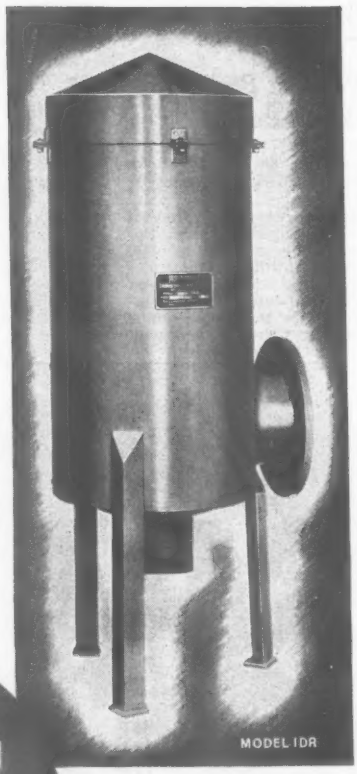

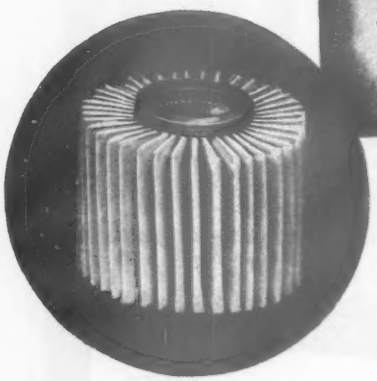

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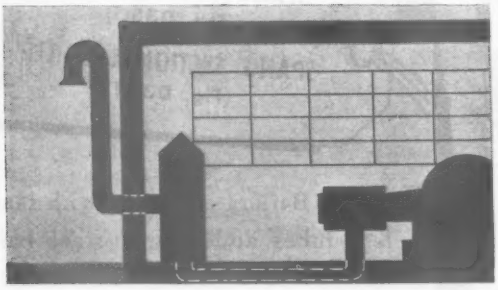

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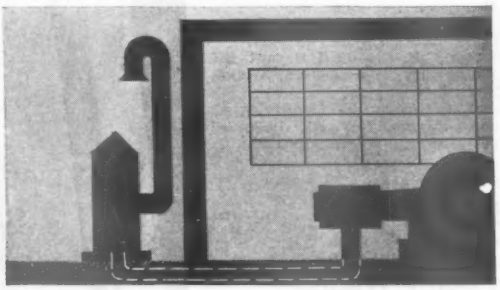

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fields at the close of June were Thackeray, Boyd, Clay City Consolidated and Bible Grove.

Only three of the 34 new operations reported during the week are wildcats. These are H. L. Cullett et al 1 Woody, SE SW NE 30-6n-7e, Effingham County; H. M. Miller 1 J. A. Fowler, NE SE 10-3n-3w, Schuyler County, and Magnolia Petroleum Co. 1 E. Hemmingham, SW NW NW 3-3s-3w, Washington County.

ILLINOIS WILDCAT FAILURES

Bond County: Bond County Gas 1 Harwood, NW NE SW 36-7n-4w, dry at 925 ft.

Clinton County: J. L. May 1 Craskin estate, SW SW SW 31-2n-2w, dry at 2,627 ft.

Marion County: Ryan Oil 1-A Galbreath, SE SE NW 26-3n-1e, dry at 2,012 ft. Menard 1,233 ft., Cypress 1,628 ft., Benoist 1,768 ft., Aux Vases 1,827 ft., McClosky 1,971 ft.

Hammer & Brehm 1 Medder, NW NE NW 25-1n-4e, dry at 3,016 ft. Menard 2,090 ft., Cypress 2,564 ft., Benoist 2,716 ft., Aux Vases 2,770 ft., McClosky 2,953 ft., St. Louis 3,005 ft.

Moultrie County: H. M. Williams 1 Seright, NW NW SW 27-14n-5e, dry at 1,928 ft. Glen Dean 1,530 ft., Cypress 1,648 ft., Benoist 1,758 ft., Aux Vases 1,820 ft., Ste. Genevieve 1,865 ft., St. Louis 1,921 ft.

Perry County: Magnolia 1 H. Jansel, NW cor. SE 18-4s-3w, dry at 1,624 ft. Menard 733 ft., Cypress 1,149 ft., Benoist 1,256 ft., Aux Vases 1,401 ft., McClosky 1,514 ft., St. Louis 1,623 ft.

Richland County: W. W. Shafer 1 Everson, SW NE SE 23-3n-9e, dry at 3,120 ft. Glen Dean 2,480 ft., Barlow 2,648 ft., Renault 2,954 ft., McClosky 3,059 ft.

MISSISSIPPI

New Producing Horizon Found in Heidelberg

JACKSON.—Southport Petroleum Co. 1 McDonald, in 35-1n-12e, in the West Heidelberg field of Jasper County, is testing a new productive zone for the pool. After perforating at 6,256-68 ft. in the basal upper Tuscaloosa, washing with water and pulling swab six times, the well started flowing, but was shut in because of lack of room in the cleaning pit. Later the well was shut in over night, building up tubing pressure of 340 lb. and casing pressure of 350 lb., and when opened on ¼-in. adjustable choke, flowed 88 bbl. of pipe-line oil in 24 hours. Gravity of the oil is 29.9° corrected.

Completions for the week in Mississippi totaled 10, with 4 successful pool wells, aggregating 1,129 bbl. of initial production, and 6 dry wildcat tries. Baxterville pool had one of the successes, Cranfield completed two wells, and the new Langsdale pool completed a good oiler.

MISSISSIPPI WILDCAT FAILURES

Claiborne County: Pure 1 Chapman, 13-11n-2e, dry, TD 10,128 ft., Comanche 10,030 ft.

Sun 1 Segrest, SE NE 7-10n-5e, dry, TD 3,554 ft., Salt 3,547 ft.

Jones County: Gulf 1 Geiger, NE SE SE 5-9n-11w, dry, TD 8,200 ft., Comanche 8,120 ft.

Rankin County: Leonard Jones et al 1 Warner, NE SE 14-5n-1e, dry, TD 2,498 ft.

Simpson County: Hunt Oil 2 Smith City Oil Co., SW SW SW 7-10n-17w, dry, TD 9,878 ft., Massive sand 9,660 ft.

Tallahatchie County: Ogg & Clark 1 Burkhalter, 1,650 ft. north and 1,980 ft. east of SW cor. of 27-26n-3e, dry, TD 4,725 ft.

LA.-ARK.

Lake St. John Pool Gets Condensate Well

SHREVEPORT.—California Co. and Carter Oil Co. 1 Alwood et al, 11-9n-10e, in Lake St. John pool of Concordia Parish, is flowing 150 bbl. of condensate per day through ¼-in. choke. The well was drilled to 10,430 ft., and perforations were made in the Massive sand at 8,985-9,056 ft.

In the Arkansas fields, the Stephens-Smart area of Columbia, Nevada and Ouachita counties, still holds first place in activity. At present, there are 28 drilling operations, including three new successful completions, and 2 near completions are pumping oil.

ARKANSAS WILDCAT FAILURE

Ashley County: Placid Oil 1 Crossett, NE SE 34-17s-9w, dry, TD 5,515 ft.

NORTH LOUISIANA WILDCAT FAILURES

Red River Parish: Carter 1 Colbert, 660 ft. south and 560 ft. west of NE cor. of NE SE 16-3n-9w, dry, TD 7,400 ft., Travis Peak 6,578 ft.

Richland Parish: R. W. Williams 1 Stone, SW SW SE 30-17n-7e, dry, TD 7,010 ft., Travis Peak 3,702 ft.

KANSAS

New Pools Opened in Barton, Rooks Counties

WILDCATTING took the lead in Kansas this week, with two new oil pools opened, and several promising tests under way. In Barton County, Harbar Drilling Co. 1 Unruh, NE NE NW 24-20-15w, has opened a new Arbuckle lime pool, with a flow of 5 to 10 bbl. of oil per hour natural, with no water. Perforations were made at 3,641-44 ft. in the Arbuckle, topped at 3,565 ft., and the well flowed with no acid. Operator is now building tanks. The well is rated as good as the Ryan pool discovery, 6 miles to the southwest.

Another Arbuckle pool has been opened in Rooks County by Darby-Bothwell, Inc. 1 Vohs, NE NE NE 14-10-19w. Good porosity and saturation was logged in the Arbuckle, and 5-in. pipe was set at 3,549 ft., at the top of the formation. After the plug was drilled, the hole filled 2,000 ft. in 5 hours, and 2,300 ft. in 12 hours from the pay zone at 3,559-62 ft. Operators plan to clean out and run liner.

Pawnee County has an interesting test in Stanolind Oil & Gas Co. 1 Benson, NW NW NW 30-23-15w, which is now drilling below 3,875 ft. The Lansing was topped at 3,626 ft., and the first drill-stem test taken, at 3,682-3,722 ft., recovered 60 ft. of mud and 300 ft. of gas-cut oil. A second drill-stem test was taken at 3,750-65 ft., and recovered 220 ft. of gas-cut oil with the tool open 30 minutes. The test is 3 miles away from production.

KANSAS SUCCESSFUL WILDCATS

Barton County: New oil pool—Black-Marshall 1 Miller, SW SW SE 3-16-12w, Feltes, Northwest, potential of 117 bbl. per day from Arbuckle at 3,342-45 ft., TD 3,345 ft., Kansas City 3,075 ft., Arbuckle 3,342 ft.

Sumner County: New oil pool—Carter 1 Latimer, NW NE 12-33-2w, potential of 157 bbl. per day from Simpson sand at 4,265-78 ft., TD 4,278 ft., Kinderhook 4,200 ft., Simpson sand 4,264 ft.

KANSAS WILDCAT FAILURES

Barton County: W. L. Hartman 1 Pillar, SW SW NE 8-20-13w, dry, TD 3,542 ft., Arbuckle 3,504 ft.

Butler County: Vickers 1 Joseph "C", SE SE NE 1-24-3e, dry, TD 2,753 ft., Arbuckle 2,748 ft.

Ed Adair 1 Seegrist, NW NE NW 36-25-6e, dry, TD 3,245 ft., Arbuckle 3,193 ft.

Decatur County: Continental 1 Lauda, NE NW SW 3-4-27w, dry, TD 4,074 ft., Arbuckle 4,036 ft.

Edwards County: Texas 1 Christman, SW SW NE 11-24-20w, dry, TD 5,128 ft., Arbuckle 5,040 ft.

Ellis County: Cities Service Oil 1 DeChant, NW NW NW 27-13-19w, dry, TD 3,825 ft., Arbuckle 3,805 ft.

Rooks County: Doley Oil 1 Lane, NE NE SE 33-10-19w, dry, TD 3,726 ft., Arbuckle 3,694 ft.

Sumner County: Carter - Pure - Sun 1 Springer, NW SW 35-32-4w, dry, TD 4,472 ft., Arbuckle 4,420 ft.

SOUTH LOUISIANA

New Shallow Pay For Cankton Area

NEW ORLEANS.—In the Cankton area of St. Landry Parish, a new shallow sand is being opened by Danciger Oil & Refining Co., 2 Gustave Pothier, drilled as a twin well to 1 Pothier, in Section 12-8s-3e. The well topped pay sand around 2,766-79 ft., and was perforated through a section about 2,774-77 ft. For a time it had considerable trouble with sand and mud coming into the hole. One screen was set which plugged up, it was taken out, and well started cleaning self, gradually increasing and working up to around 50 bbl. per day through ⅜-in. choke, the crude testing 29.6° gravity. This is the first shallow sand found productive in this district, production ordinarily being found below the 10,000-ft. level, and the area is looked upon as having even greater possibilities due to the initial deep test also showing still another untested sand about 30 ft. below the latest discovery.

Noble & Baker 1 W. E. Caldwell, wildcat in 52-9s-2w, in the South St. Gabriel area of Iberville Parish, attempted to blow out at total depth of 9,212 ft. and operators are now conditioning mud.

Eighteen new locations were announced this week, double the previous week when nine new tests were reported. Lafourche Parish led with four locations, Acadia and Jefferson Davis three each, Plaquemines two, and one each in Iberville, St. Charles, St. John, St. Mary, Terrebonne, and Vermilion parishes. Of the five completions one was a wildcat failure in Calcasieu Parish, three were producing field wells, one each in Beauregard, Plaquemines, and Vermilion parishes, and one dry hole in St. James Parish.

SOUTH LOUISIANA WILDCAT FAILURES COMPLETED

Calcasieu Parish: Union Sulphur Co., Inc. and Gulf Refining Co. 1-A W. T. Brannon, Choupique area, 16-11s-10w, dry, TD 9,980 ft.

Ecuadorian Exploration

The International Ecuadorean Petroleum Co., subsidiary of International Petroleum Co., Ltd., completed three wells in Ecuador in 1944, compared with four finaled in 1943. Surface investigations and exploratory drilling were carried on during the year, and while no wildcat successes were completed, the information obtained will help materially in planning future drilling. At the end of 1944, the company held 4,625,060 acres under concession.

PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

FOR WEAK DRILL PIPE

Drill fast with minimum of weight, and minimum torque.
15 degrees bottom roller action to center of hole.
Steel ball and roller bearing construction through all moving parts.
See Composite Catalog—Literature and Prices upon request.

ZUBLIN DIFFERENTIAL BITS

UNIVERSAL ENGINEERING CO.
OFFICE AND FACTORY
2369 EAST 51st ST. • LOS ANGELES 11, CALIFORNIA
BRANCHES: HOUSTON, TEXAS • LAKE CHARLES, LA.
BAKERSFIELD, VENTURA AND AVENAL, CALIFORNIA

Among the Drilling Contractors

Andrew S. Hoyt has been awarded drilling contract on the Arthur J. Boeve 1 Fleming Bros., in SE NW NW 35-3n-16w, Allegan County, Michigan.

Snyder & Head, Calgary, have the contract for deepening Pekisko Hills 1, LSD 6, 6-17-2w5, for Highwood-Sarcee Oil Co. The test is on the Highwood uplift south of Turner Valley, and the well, standing in Banff shales at 4,485 ft. after drilling through the Madison will be deepened to test the Devonian limestone.

Herndon Drilling Co. has staked location for 1 Replogle, NE NW NE 13-13n-7e, in northwestern Okfuskee County, Oklahoma. The well will be a Wilcox test.

Stover & Rawlings of Chatham are rigging up for West Petroleum 2, to be drilled in the bed of Lake Erie, 1 mile offshore from Romney Township of Kent County. Pier for the drilling rig was recently completed, location being ½ mile west of West Petroleum 1, drilled 2 years ago by Stover & Rawlings, which set a new record for offshore distance in Lake Erie drilling.

Newell & Chandler of Calgary are nearing completion of Toronto Syndicate 2, LSD 4, 6-22-13w4, in the Steveville-Princess field of eastern Alberta.

H. R. Allen is the contractor on the Waters & Farley Development Co. 1 M. Dickerson and 1 Martensen, NW SW SE 16-1s-14w, Van Buren County, Michigan.

Stuart Godfrey, Bangor, has secured drilling permit for 3 Woods, NE NE SE 23-1s-14w, in Van Buren County, Michigan. He also has been awarded the drilling contract for P. F. Broughton 1 Newton and Ora Pool, NW SE NW 25-1s-14w, in Van Buren County.

Kingwood Oil Co. is the contractor for Lynn Oil Co. et al 1 Lundy, NE NE SW 9-17n-1e, LeFlore County, Mississippi.

B. & M. Construction Co. of Oklahoma City has the the contract to drill the Aikin Oil Co. et al 1 Stewart, a wildcat in NW NW SE 7-34-2w, Sumner County, Kansas. The test is about 8 miles south of Carter Oil Co. 1 Latimer, recent discovery well.

R. D. Morgan is rigging up to drill the J. L. Cates et al 1 J. A. Steele, Tr., Section 6-21n-2e, in Greene County, Alabama.

Helmerich & Payne, Inc., Tulsa, are the contractors for J. W. Sorrells 1 J. W. Ledbetter, NE NE NE 32-11n-1e, in Yazoo County, Mississippi.

Iron Drilling Co. will drill the Transwestern Oil Co. 1 Johnson, NW NW SW 28-19-12w, in Barton County, Kansas.

Conway Drilling Co. will drill the Kirby Petroleum Co. B-2 Long Bell Petroleum Co., NW NE SE 30-1n-18e, in Langsdale field of Clarke County, Mississippi.

N. R. Dodd of Holland is moving in tools to drill the A-2 Nich Dykhuis, NE NW SW 2-4n-15w, in Allegan County, Michigan.

Harbar Drilling Co., Wichita, has extended a new pool with its 1 Berger, in SE SW NE of 14-23-2w, a mile south of production in the Halstead pool, Harvey County, Kansas.

NEW!!
"MITT-GRIP"
COLLAR
...for Wells' Stubby
ELECTRODE HOLDER

- Makes rod-changing *easier* and *quicker*, because it provides a positive, convenient grip on the insulator.
- Holds small rods upright and away from work.

See your local distributor.

"More Arc Time"
Martin Wells
ELECTRODE HOLDERS
Los Angeles 1, California

MODEL 3H
300 Amp.

PROVED
IN PEACE—IN WAR

'BESTOLIFE Lead Seal Joint Compound has been used successfully in the Oil and Refining industries for the past fifteen years. During that time, it has proved itself superior in protecting threads and in providing tight joints which can be broken easily.

Today, 'BESTOLIFE has enlisted in the Navy, Merchant Marine and Defense Plants for the duration, and we are proud of this assignment to help in the Victory effort.

But there are still ample stocks of 'BESTOLIFE available on any priority rating, at supply house field stores in every drilling district in the United States and Canada. Use 'BESTOLIFE Tool Joint Compounds for best results!

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EXTRA SUPERIOR MANILA
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(TRADE MARK REGISTERED U. S. PATENT OFFICE)
THE ONE BOLT COUPLING

UNIBOLT XMAS TREE FITTINGS

(Compared with flanged fittings!)

Weigh a great deal less . . . have a substantially higher safety factor . . . and are easier on your pocketbook.

THORNHILL-CRAVER COMPANY
HOUSTON

W. Spencer Cook, Allegan, will drill the Charles W. Cook and W. Spencer Cook 1 Boyer, SW SE SW 32-4n-15w, in Allegan County, Michigan.

Summit Drilling Co., Tulsa, was forced by high water to shut down temporarily at Midco Oil Corp.'s Wilcox sand test, 1 Maltby, NW NE NE, in 25-24n-2w, southeast of Billings, in Noble County, Oklahoma.

Merrill Drilling Co. is the contractor for Arthur E. Williams 1 Cook, a wildcat in SW SE SW 14-9n-1w, in Gratiot County, Michigan.

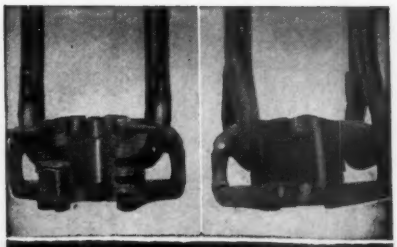
Kerlyn Oil Co., Oklahoma City, has started work on 3 Mullinix, in NE NW NE of 13-3n-1e, in the East Pauls Valley field, Garvin County, Oklahoma, for The Ohio Oil Co.

Lester Drilling Co. has completed for Gulf Refining Co. the sixty-fourth producing oil well in the Eucutta field, Wayne County, Mississippi. It is the 25 Stanley, 3-9n-9w, drilled to 5,339 ft. A pumping unit is being installed.

Taggart Bros. Co., Big Rapids, will move in company tools for the 19 Beall-Granger W-Evart, center of SE 24-18n-9w, in the West Evart pool of Osceola County, Michigan.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, General Land Office, Washington, D. C. Notice is hereby given that sealed bids will be received until, and opened at noon on Tuesday, July 31, 1945, for land described herein situated within the known geologic structure of the Hatfield Dome field, Wyoming. This land is offered to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act as amended by the Act of August 21, 1935 (49 Stat. 674, 30 U. S. C. sec. 226) in the following parcels: Parcel No. 1, T. 19 N., R. 88 W., sec. 2, SE¼NE¼, NE¼SE¼, 80 acres. Parcel No. 2, T. 19 N., R. 88 W., sec. 2, SW¼SE¼ sec. 10, NE¼NE¼, 80 acres. Parcel No. 3, T. 20 N., R. 88 W., sec. 34, SE¼SE¼, 40 acres. Total 200 acres. Bids must be submitted on each parcel separately, but if two or more parcels are awarded to the same bidder they may be included in a single lease. Each bidder must submit with the bid one-fifth of the amount bid in cash, or by certified check made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease, required by section 7, of Circular 1386. The envelopes should be plainly marked "Bid for Parcel No. .., Hatfield Dome Field. Not to be opened before noon Tuesday, July 31, 1945." No bids received after the hour fixed herein for the opening of bids will be considered. The remainder of the bonus and the annual rental at the rate of $1 per acre must be paid and a $5,000 corporate surety bond must be furnished by a successful bidder prior to the issuance of a lease. The deposits of the other bidders will be returned upon acceptance of the successful bids by the Secretary of the Interior. The successful bidder will be required to agree not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and to require an identical provision to be included in all subcontracts. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Fred W. Johnson, Commissioner.



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BJ "AA" ELEVATORS ARE REALLY BALANCED

By incorporating a newly devised roller type balancing cam in BJ "AA" Elevators the work of the derrick man is made much easier. Rated at 300 tons, with a safety factor of four to one, this elevator is made of high alloy steel—fully heat treated—flame hardened on the top bore to minimize upsetting—and is equipped with an unusually sturdy latch. Ask the BJ man or your supplier.

BYRON JACKSON CO.
Houston • LOS ANGELES • New York

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DRILLING ENGINES
MAKE A HIT WITH
COST WISE
OPERATORS

Choice of a YOUNG Drilling Engine is influenced by a good many advantages which operators see in its adaptability to their specific needs. But the man who knows his costs sees more than speed, convenience, and accurately controlled power. He knows that here is a piece of equipment that helps cut drilling costs to a minimum. His own figures prove it.

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Iverson Tool Co., Texas, Artesia, New Mexico
Branchland Pipe & Supply Co., Huntington, W. Va.
Connelly Machy. Co., Billings & Great Falls, Mont.

OTHER YOUNG PRODUCTS
Natural Gas Carburetors • Orifice Gas Well Testers
Under-Road Boring Machines • Electric Light Plants

PERSONALS

Trax Leaves PAW To Go Back to Gulf Oil

DAVID L. TRAX, who recently resigned as assistant director of the division of materials, Petroleum Administration for War, to rejoin the staff of Gulf Oil Corp. in Tulsa, entered the oil business as a roustabout in his early youth. He had graduated from Cornell University as an engineer when he enlisted in the Twenty-eighth (Keystone) division for service in World War 1. He was wounded in the Argonne Forest fighting and was awarded the Purple Heart with Oak Leaf Cluster.

The war over, young Trax spent 3 years in the oil fields of Wyoming with Midwest Refining Co. as field foreman. He has been with Gulf more than 20 years as field foreman, engineer, and staff assistant in the production department. He was in PAW service 21 months. He is active in the affairs of American Petroleum Institute and American Institute of Mining and Metallurgical Engineers.

George Hoy, Farmington, N. M., has joined the Honolulu Oil Corp. geological department in Midland.

Edward R. Thatcher, of San Francisco, has been appointed assistant director of materials, Petroleum Administration for War, Washington. He will handle foreign materials requirements after serving for several months as director of materials for District 1. Previous to accepting appointment to the PAW organization, Thatcher had been purchasing agent for Standard Oil Co. of California, an organization he joined in 1919. Thatcher is succeeded as director of materials division, District 1, by **George Frederick Will,** Shell Oil Co., Inc., New York.

Vernon B. Bottoms has become district petroleum engineer for the Superior Oil Co. at the Midland office. He was formerly district production engineer for Sinclair Prairie Oil Co. at Oklahoma City.

H. P. Saueressig of Southern California Gas Co. has been appointed administrative engineer of the company's butadiene plant in Los Angeles, succeeding **Dr. C. Gordon Milbourne,** who recently resigned to return to the Ugite Corp. Milbourne has been on loan to Southern California Gas Co. for the past year during and after construction of the gas generator units. Saueressig has been staff engineer for the past year and in his new capacity will report directly to **Grove Lawrence,** manager.

John C. Worden, Shell Oil Co., Inc., was recently transferred from the company's Wilmington refinery to the Martinez refinery and retains his title of assistant chief engineer.

W. M. Fitzgerald, formerly with Stanolind Oil & Gas Co. in East Texas, is now scout for American Trading & Production Corp. in Midland, Tex.

Glen Blauvelt, who was manager of the Monett, Mo., group of properties for The Gas Service Co., has been made manager of the Beloit, Kans., group. **Carl H. Jenkins,** formerly chief clerk for the company, takes Blauvelt's old post at Monett.

Roy G. Rhodes, in the service of United Natural Gas Co. since 1928, has been made commercial manager of the company's office in Franklin, Pa., succeeding **James M. Bridges,** who retired.

R. R. Porterfield, formerly in charge of the Midland, Tex., office of Devonian Oil Co., has been made head of the company's land and geological department in Fort Worth. **B. Cooper Hyde** will fill Porterfield's former position in Midland.

Lt. Col. Ralph Curtis, who for 2½ years served on the Army-Navy Petrolem Board in Washington, has returned to civilian work with Barnsdall Oil Co. in Tulsa. Colonel Curtis, an engineering graduate of Colorado School of Mines, was superintendent of production in Kansas for Barnsdall when he entered military service as a captain. He is now engaged in proration engineering.

J. Taylor Fly, since 1942 on the legal staff of Creole Petroleum Corp., Venezuelan affiliate of Standard Oil Co. (New Jersey), has been elected a director of the company. **LeRoy Wilson,** for 30 years asso-

J. T. FLY

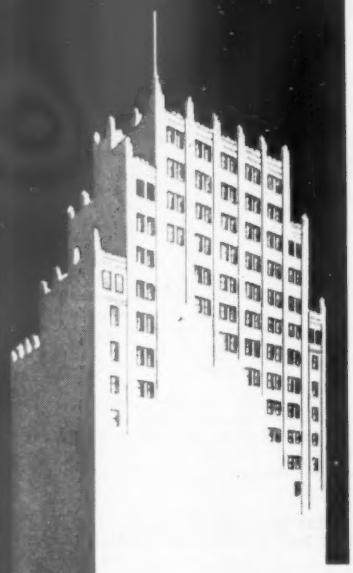
LEROY WILSON

ciated with foreign and domestic affiliates of Jersey Standard, has been named employe relations manager for Creole. Fly, a graduate of University of Texas, specialized in Latin-American law during many years of private practice. In 1935 he joined Standard Oil Co. of Argentina at Buenos Aires, where he remained until 1942, when he went to New York. Wilson was appointed secretary to the producing committee and managerial assistant in the producing department of Jersey Standard in 1933. Since 1943 he has been in charge of the company's office of Argentine coordination, in New York.

James S. Meriwether, Shell Oil Co., Inc.; **Paul R. Martin,** The Pure Oil Co., and **A. A. Jones,** Atlantic Refining Co., comprise a committee to supervise plans for a new building to house the sample-cut and other activities of Midland (Tex.) Oil Scouts Association. Companies with scouts in the association, of which Meriwether is president, are contributors to the fund for construction of the building, to be a one-story structure, 44 by 120 ft.

M. L. Arnold, Richfield Oil Corp., was elected president of California Natural Gasoline Association at its recent annual meeting, and **M. W.**

in the Southwest
The BLACKSTONE
means The BEST—



At The Blackstone your room is well-appointed and attractive; your bed is comfortable and service is efficient. Food at The Blackstone is famous throughout the Southwest. Owned and managed by Texans.

The BLACKSTONE
FORT WORTH'S HOTEL OF DISTINCTION
JOE T. O'KEEFE, President
E. B. HANNA, Manager

Kirbe, General Petroleum Corp. of California, vice president. **E. C. Spencer,** The Norwalk Co., was chosen chairman of the Taft chapter.

W. F. Moore, for some 25 years in the service of The Texas Co. or its affiliates, has been named general manager of foreign operations of the company. Moore formerly was president of Gasoline Products Co., an affiliate, and later was for several years purchasing agent for Texas. Recently he had been assistant to W. S. S. Rodgers, president.

Howard G. Fillhower, formerly director of industrial relations for Continental Electric Co., has been named industrial relations supervisor at the Bayonne, N. J., refinery of Tide Water Associated Oil Co. He succeeds **L. O. Smith** who has been suffering from protracted illness. **Charles J. Murray** is assistant to Fillhower, handling labor relations. **Joseph A. Kelly** has also been appointed an assistant, handling personnel details.

Walter G. Kirkbride, formerly vice president of Hickok Oil Corp., Toledo, and its legal counsel, has been elected president, succeeding Arthur S. Hickok, who died June 30. **Carl F. Eisenhour,** former secretary and assistant treasurer, was elected vice president and retains the position of secretary. **Capt. Clarence H. Hickok,** son of the founder, becomes a director, to succeed his father, and a vice president.

John A. Whitely, manager of purchases for Pan American Petroleum & Export Co., has been elected chairman of the oil company buyers of Purchasing Agents Association of New York. **R. M. Morrison** of The Texas Co. was reappointed chairman of the oil company buyer's group of National Association of Purchasing Agents.

Col. Martin B. Chittick has returned to The Pure Oil Co. in Chicago after 4½ years' service in special staff work with the U. S. Army in Europe and the United States, to resume his position as manager of specialty and technical sales.

CALENDAR

July

Board of directors Rocky Mountain Oil and Gas Association, Townsend Hotel, Casper, Wyo., July 25.

October

American Association of Oil Well Drilling Contractors, Oklahoma City, October 1-2.

Texas Mid-Continent Oil and Gas Association, Rice Hotel, Houston, October 4-6

I.P.A.A., annual membership meeting Tulsa, October 15, 16 and 17.

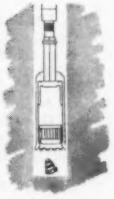
Get Loose Junk Quick with a
COOPER
DIE-FORMED
BASKET

Get cones or other junk too large for ordinary baskets—and get it **all** in one grab! The special Cooper die-forming principle makes this the fastest, easiest-operating, most efficient tool of its kind. No need to circulate, rotate or make hole to pick up junk, though bridges can be drilled when encountered. The steel fingers scrape bottom as they close, catching and retaining both big and little objects. Does the job in less than 3 minutes on bottom.

POSITIVE OPERATION AT ANY DEPTH!

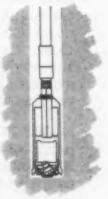
RUN TO BOTTOM

Attach the Cooper Die Formed Basket to the drill pipe and run it to bottom. No need to circulate, rotate or to make hole.



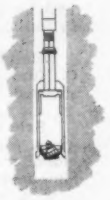
APPLY WEIGHT

Pressure shears the four pins which prevent fingers from closing prematurely, forces the fingers through the die inside the shoe.



STEEL FINGERS SCRAPE BOTTOM

The steel strips curve and interlock as they are driven through the die, forming a tight basket that picks up and retains both big and little junk.



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Texas—Wilson Supply Co.
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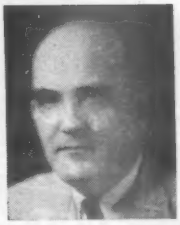

F. M. MAYER

F. I. BRINEGAR

Equipment Men in News

Carl B. McLaughlin will head up the recently established engineering service division of Tube Turns, Inc., Louisville, Ky., it is announced by **John G. Seiler,** vice president in charge of sales. McLaughlin formerly was associated with Tube Turns' Pittsburgh office.

Wm. F. Huggins has been appointed as manager of foreign sales by **J. M. Dolan,** general sales manager of Le Roi Co. Huggins brings to the company considerable foreign experience gained in his association with power export division; Remington-Rand, Inc., Argentina; the Foreign Economic Administration in Washington; and with South American Commercial Co.

Establishment of new offices in Dallas, Tex., opening July 1, is announced by The McCarty Co., advertising counsellors. **J. B. Taylor** will be in charge of the new office located at 1311 Praetorian Building.

Continental Supply Co., Dallas, Tex., announces that the following changes become effective July 1, 1945: **William J. Morris** is chairman of the board of directors; **Frederick M. Mayer** is president, and **Frank I. Brinegar** is executive vice president.

United States Steel Supply Co., subsidiary of U. S. Steel Corp., with headquarters in Chicago, has announced the election of **William L. Davis** as vice president in charge of operations.

A. M. Lockett & Co., Ltd., has announced the appointment of **George R. Hammett** as manager of sales of the New Orleans district office, effective July 1. He succeeds **R. P. Lockett,** recently elected vice president of the company.

Beginning July 1, 1945, sales of products manufactured and now being sold separately by the American Steel & Wire Co.; Carnegie-Illinois Steel Corp., and Tennessee Coal, Iron & Railroad Co. will be conducted by and in the name of Tennessee Coal, Iron & Railroad Co. in the 11 southern states—this with the exception of wire rope for the oil industry. Under this new arrangement sales jurisdiction in Oklahoma will be transferred to the Tulsa district sales office.

W. Marshall Dale has been appointed executive vice president of Bowser, Inc., liquid control specialist, according to **R. Hosken Damon,** president of the company. Dale resigned as president of Indiana Service Corp. in Fort Wayne, Ind., to assume his new position. Prior to joining that corporation in 1935 he was vice president and treasurer of Public Service Co. in Indianapolis.

Hercules Powder Co. announces the appointment of **William C. Hunt** as an assistant general manager, and **Harry V. Chase** to succeed Mr. Hunt as director of operations.

Sale of the Denver dealer franchise for Cummins Diesel Engines, effective April 1, 1945, to **Jay B. Chambers,** Cummins regional manager in the Mid-Continent area since 1935, has been announced by the Cummins Engine Co., Inc., Columbus, Ind.

Plastic Coating Corp., Houston, Tex., announces that they now have available a field service for the application of plastic coating materials to internal and external surfaces of oil storage tanks, tubular goods and other metal surfaces as a corrosion preventive.

The board of directors of Thermoid Company announced the election of **John Owen** as assistant vice president of the corporation. He will continue as manager of the Industrial Rubber Division.

Refinery Equipment, Inc., Tulsa, Okla., has been appointed exclusive distributor in the Mid-Continent area, of cast and forged steel valves and fittings manufactured by Security Engineering Co., Inc., of Whittier, Calif. The company has also been appointed sales agent for the Wireco products of Wire Rope Corp. of America, of New Haven, Conn.

H. K. Porter Co., Inc., announces the establishment of a new office in Washington, D. C., and the appointment of **Harold L. Kennedy** as district sales manager.

J. W. Johnston has joined Westcott & Greis Co., effective June 1 to specialize in the sale of Smith liquid meters.

A five-star "E" flag is now flying over the plant of Union Wire Rope Corp. of Kansas City, Mo., marking the start of the company's fourth year of outstanding production for the Navy.

Jack C. Lyle has joined Ludlow Valve Manufacturing Co., Inc., of Troy, N. Y., to take charge of its southern territory.

Marshal L. Noel, previously industrial sales manager, and long identified with the company's crawler tractors and road machinery sales division, has been appointed general sales manager of Allis-Chalmers Tractor Division. **William J. Faulkner,** formerly manager of the tractor division's Washington, D. C., office, has been named industrial sales manager.

%Proportioneers, Inc.%, Providence, R. I., U.S.A., announce the appointment of %Dosificadores Y Valvulas, S. A.%, Dolores No. 16, Mexico, D. F., to represent the company in that territory. The new organization is headed by **Mariano Lara** and **Manuel Garcia Sands.**

Richard E. Merrell, formerly manager of national account sales, AC spark plug division of General Motors, has been appointed sales promotion manager on all AC replacement products. **Earl McGinnis,** formerly advertising manager, becomes manager of national account sales, and **Frank E. Ray,** who was assistant advertising manager, becomes advertising manager.

The removal of H. K. Porter Co., Inc., offices in Rochester to headquarters in the Walbridge Building, Buffalo, N. Y., has been announced by **W. W. Calihan,** sales manager. **W. A. Coyle** has been appointed district manager in charge of sales for Porter and Devine process equipment. He will also handle sales for Quimby Pumps and Fort Pitt Steel Castings in the territory.

A fifth renewal of the Army-Navy "E" Award for outstanding war production has been granted The McKay Co.'s plant at McKees Rocks, Pa.

Ethel Serfas Klingman has been promoted to the post of manager of advertising for Pennsylvania Salt Manufacturing Co., succeeding **H. M. Ellsworth,** who recently resigned.

Aurora Pump Co., Aurora, Ill., has been given a second renewal of the Army-Navy "E" award for meritorious service on the production front.

Leon D. Thompson has been appointed export sales manager for Oliver United Filters, Inc., New York, Chicago, and Oakland, Calif.

The Carteret, N. J., plant of Foster Wheeler Corp. has just received the Army-Navy "E" award for the sixth time. The occasion was marked by a simple ceremony at the plant.

René Berg, president of American Premaberg Co., Inc., 7 West 45th Street, New York, manufacturer of tank accessories and other materials for the producing end of the industry, is inspecting operations in the Mid-Continent and renewing acquaintances with numerous supply men whom he had met during prewar years when he was French representative for several American equipment firms. In addition to his recent decision to enter the domestic equipment-manufacturing field, Berg is preparing to reestablish his export service for France and other European producing countries. He was in the French Army when the surrender to Germany occurred and escaped to this country in 1941. He worked with Free French missions and United States military authorities in Washington on plans for the Normandy invasion and related tactics for liberation.